Telephony.

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RULES OF THE GAME.

First of all is the rule of publicity, not doing anything under cover, letting the public know what you are doing and judge of it as it is. There are a great many businesses in this country that have fallen under suspicion because they were so secretive, when there was nothing to secrete that was dishonorable.

In the second place, there is a full equivalent for money you receive—the full equivalent in service—not trying to skimp in the service in order to increase profits above a reasonable return, but trying to make the profits proportioned to the satisfaction of the people that you serve.

In the third place, this game requires something more than ordinary sports. It requires a certain kind of conscience in business, a certain feeling that we are after all in this world because we are expected to "make good" according to the standards of the people we live with.

The fourth rule, as it seems to me, is the rule of having the spirit of service. I am not meaning a sentiment, I am not meaning a state of mind; I am meaning something very concrete—that you want to see to it that the thing that you do for the public and get money for is the best thing of that kind that can be done.—Woodrow Wilson.

Independent Telephone Companies and Dividends.

The financial statistics of telephone companies given in the United States census report for 1912, present figures regarding telephone companies which are of considerable interest.

A study of dividends paid by telephone companies, which reported, shows that only about one-third of the non-Bell companies pay dividends on common stock and about two-thirds on the preferred stock. This is, apparently, not a favorable showing for the Independent companies, but an explanation may be made which presents a different aspect to the situation.

It is admitted that the securities of the A. T. & T. Co. are easily disposed of at good prices, the reason being that telephone securities in large lots are more easily marketed in the Wall Street district. In the case of the Independent companies, the case is different. They being relatively smaller and more scattered, there is a natural inability to secure as easy a market. Securities of all kinds are not easy to dispose of except at a considerable discount. The telephone companies are not the only utilities that have found it difficult to finance themselves at anywhere near a fair price. For instance, if money were required for extensions costing $50,000, a bond issue for that amount would bring in only about $42,500. In other words, the bonds would have to be sold at a discount of 15 per cent.

The earnings of the telephone companies were usually sufficient to pay good dividends in addition to all charges. Hence when confronted with the question of issuing bonds at a considerable discount, many companies decided to withhold dividends and put the earnings into the plant. The value of the property was therefore increased. At a later time when the sentiment of the money market changes, the earnings put into the plant may be capitalized. An issue of bonds may be sold at somewhere near its par value, and the proceeds used to pay stockholders the back dividends. The money for the extensions may thus be obtained at practically no cost, except for the loss of interest on the dividends withheld.

Many Independent telephone companies have been obliged to resort to this method of financing and thus the number of companies paying dividends is not as large as might be expected. But the telephone industry is now being recognized as a stable business. The Independent companies have won a place for themselves and proved to investors that they are reliable revenue producers. Therefore, when funds are needed, it will not be necessary to suspend dividends and put earnings back into the plant on account of the impossibility of securing money except by paying a high rate for it.

We Send Too Many Men to Jail

By HERBERT KAUFMAN

Let's look at this subject of criminals from a business standpoint. We've left it in professional and rhetorical hands for too long.

The philosophers and criminologists and philanthropists and reformers and doctors are still holding a Donnybrook fair on the situation. But then experts are frequently more interested in finding their rivals wrong than in setting matters right.

One group of eminent highbrows steadfastly contends that the crook, himself, is solely responsible for his acts. Another school as vehemently declares that his aberrations are legacies from a few careless grandfathers; and quite a number of first rate surgeons lay the blame to bumps. While they're quibbling and nibbling at the problem, suppose we try the effect of a little common sense.

Whatever the cause that sends men off the track, the cost to the community remains the same. It isn't heredity, or cussedness, or mental deficiency, that contributes chiefly to filling our reformatories, but stupidity on the part of society. Thousands of men who get into jail don't actually belong there.

We're still obsessed with a bunch of obsolete notions; hand-me-downs from an obtuse past—a past warped by the cruelty of ignorance and bigotry.

There are fool streaks in almost all folks. Lots of people just make mistakes. Some are impulsive, some asinine, some temporarily weak—and so are you. For every convict put away for trifling misdemeanors, there are a hundred respectable citizens who at one time or another have merited the same punishment.

These men turned out to be useful and competent persons. They are still first class machines despite the fact that they occasionally slipped a cog. And the majority of felons would have turned out to be valuable and trustworthy individuals if they hadn't been so quickly turned over to the authorities.

You don't junk an engine the instant it gets out of order. You tinker it up, tighten the loose screws. It takes an irreparable break-down to condemn it to the waste heap. Your wife doesn't throw a spotted apple into the garbage pail; a surface bruise is of no consequence if the fruit's sound at the core. It's sheer economic waste to destroy so much available and needed material—to discard so many trained workers without first examining their fitness to rehabilitate themselves.

What family is not aware of circumstances which, if discovered, would have placed at least one of its members behind the bars? Are you any worse today because of your mis-steps? Didn't you seize your chance and reform?

You were quite probably a bad boy, or a wild youngster, yourself.

The safe are prone to be selfish. Our attitude toward the criminal is mainly contributory to the production of a criminal class. More forbearance and out of court justice would benefit humanity in the main and retain multitudes of worth while folks in the ranks of utility.

We have accomplished marvels in physical reclamation. We have chemicals with which to check decay in matter. We are thrifty repairers of tools and equipment. But one of the greatest needs of civilization awaits efficient consideration: We have not yet really tackled the job of promoting a philosophy which will arrest deterioration in humans. Put yourself in the convict's place before you put him there.

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Important Meeting of National Association Directors

At a Two-Day Session at Hotel La Salle, Chicago, April 16-17, Directors Adopt Declaration of Principles for Present Year—Condemn A. T. & T. Toll Line Agreement—Meet with Directors of Independent Telephone Association of America

One of the most important meetings of the board of directors of the National Independent Telephone Association was held at the Hotel La Salle, Chicago, on April 16 and 17. The directors in attendance were: C. Y. McVey, Ohio; H. D. Critchfield, Illinois; N. G. Hunter, Indiana; W. C. Handlan, West Virginia; A. G. Bean, Ohio; H. B. McMeal, Illinois; A. F. Adams, Missouri; Terry W. Allen, Tennessee; L. D. Kellogg, Illinois; and F. B. MacKinnon, District of Columbia.

The committee on resolutions in submitting a declaration of principles stated that inasmuch as the association had at various times adopted resolutions ,it seemed wise to revise and re-affirm these resolutions with some additional ones, and submit them to the telephone companies and the public as the principles for which the association stands. The resolutions were then unanimously adopted, as featured on this page. The resolutions committee was composed of H. B. McMeal, chairman; A. G. Bean, A. F. Adams, W. C. Handlan and S. G. McMean.

DECLARATION OF PRINCIPLES, NATIONAL INDEPENDENT TELEPHONE ASSOCIATION, ADOPTED APRIL 16, 1915, AT CHICAGO.

Resolved, That the furnishing of telephone service is a business proposition in which the interests of the user and the company furnishing the service are interdependent. Telephone service is furnished under different conditions in different parts of the country. To meet these ever-varying conditions, we favor locally-owned, Independent telephone systems,reserving to the people, however, in any locality (with the consent of the regulatory body having control) the right to determine for themselves what kind of telephone service they shall have and by whom it shall be given.

We favor the enactment of such laws as will secure to every local telephone system, adequate long distance service, without discrimination and upon equal terms with every other such system, from all companies furnishing long distance service, thus giving universal service without universal monopoly.

Whereas, the American Telephone & Telegraph Co. has not carried out the spirit and intent of the stipulation with the Federal Government under its letter of December 19, 1913,

And, whereas, the toll connection agreement now offered to Independent telephone companies is grossly unfair,

Now, therefore, be it resolved:

That a committee of three be appointed to confer with the Department of Justice and the Interstate Commerce Commission with the view of securing a fair toll connection contract, and if suitable action cannot be obtained under present conditions, that this committee be instructed to work for the enactment of such physical connection laws as will secure interstate long distance connections for Independent telephone companies under the supervision of the Interstate Commerce Commission.

Whereas, the immediate future bespeaks renewed prosperity for the Independent telephone business and the demands of the future looking to the legitimate extension of the business, and the protection of the properties now in the Independent field are such as to demand the united efforts of all Independent telephone men in the United States, and

Whereas, we believe there are no weighty reasons why all Independent interests should not and cannot be united;

Therefore, be it resolved by this board of directors, that the "Get-Together" committee of this association be instructed to use every effort to bring about a consolidation of the two national associations and that each member of this board work with this committee to speedily bring about the above result.

Whereas, there is a growing demand for Independent telephone securities throughout the country,

Therefore, be it resolved that this board approves the formation of companies for financing of Independent telephone companies and the marketing of Independent telephone securities.

Believing that there is at this time an overlapping of jurisdiction and a duplication of control by state commissions and the Interstate Commerce Commission, which produces unnecessary expense and uncertainty that should be eliminated, we favor an act by Congress providing that the control and regulation of exchange business and purely local or intrastate toll business shall be left entirely to the states.

We favor the enactment of such laws, if any be necessary, to prohibit any corporation, partnership or individual furnishing telephone service, from engaging in the manufacture of apparatus, material or supplies except for its own use.

The committee on the toll line contract offered by the American Telephone & Telegraph Co. made the following report:

"At the meeting of the board of directors held in the Hotel La Salle, Chicago, March 20, the following resolution was adopted:

Whereas, the American Telephone & Telegraph Co., has not carried out the spirit and intent of the stipulation with the Federal government under its letter of December 19, 1913, and Whereas, the toll connection agreement now offered to Independent telephone companies, is grossly unfair.

Now, therefore, be it resolved that a committee of three be appointed, to confer with the Department of Justice, and the Interstate Commerce Commission, with a view to securing a fair toll connection contract, and if suitable action cannot be obtained, under present conditions, that this committee be instructed to work for the enactment of such physical connection laws as will secure interstate long distance connections for Independent telephone companies under the supervision of the Interstate Commerce Commission.

Pursuant to this resolution, the president appointed Frank A. Davis, of the Ohio State Telephone Co., of Columbus, Ohio; C. E. Tarte, of the Citizens Telephone Co., of Grand Rapids, Mich.; and Terry W. Allen, of the Allen properties of Jackson, Tenn., members of the committee, with the president and secretary of the association ex-officio members.

A conference with the officials of the Bell company was held in New York City, April 13, 1915. This conference was arranged at the suggestion of this committee inasmuch as the committee desired to make sure of the attitude of the Bell company before conferring with the Attorney General and Interstate Commerce Commission.

As a result of this conference, the committee desires to report:

1. The Bell company stands ready to enter into, with one

or more companies, the toll contract as originally drafted, and submitted to this association, March 16, 1914.

2. The Bell company, if a satisfactory number of Independent companies indicate their approval, will agree to the following modifications of that original contract:

(a). The ten-cent differential will be made reciprocal, and will be paid to the terminating company—the company whose subscriber is called.

(b). A compensation of five cents will be paid the Independent company entering into the contract for all messages originated by it.

(c). The Bell company will enter into a contract for long lines business only.

Your committee repeated its belief that the Independent company should have routing privileges equal to those granted the Bell company. This modification, the Bell company refuses to make. Your committee also expressed the opinion that on messages the charge for which exceeds 50 cents, a compensation of 10 cents per message will have to be paid to satisfy the members of this association.

Your committee recommends that the proposition to the Bell company be not accepted, and that the committee, if continued, be empowered to adopt such procedure as will in its opinion secure such terms from the Bell company as will be acceptable to this association."

After the reading of this report, the following resolution was adopted:

Whereas, the so-called qualified toll line contract offered Independent companies in connection with the agreement of the Bell company and the Attorney General under date of December 19, 1913, is not acceptable to the members of this association, and

Whereas, this association through negotiation has not succeeded in securing satisfactory modification of said contract,

Now, therefore, be it resolved that the toll contract committee is hereby empowered to take such action as may be necessary to secure the desired connections with the toll lines of the Bell company for Independent companies on such terms as will be satisfactory to the members of this association, and fully carry out the spirit and intent of the aforesaid agreement between the Bell company and the Attorney General of the United States.

The manufacturers' committee asked the board of directors for more time in which to make its report, which was granted. This committee will make a full report at the next meeting of the board.

The board spent considerable time in the discussion of general conditions in the telephone field and on the morning of April 17 met with the board of directors of the Independent Telephone Association of America in an informal way. Addresses were made by Messrs. Critchfield, Hunter, McVey and MacKinnon of the National Independent Telephone Association, and by Messrs. Fisher, Randall, Bryant and Reber of the Independent Telephone Association of America. These addresses were along the lines of co-operation between the associations, in dealing with the A. T. & T. toll line agreement and the Western Electric relationship to the industry.

Both associations are doing a great deal of constructive work and it is to be hoped many of the vexing problems in the telephone field will be settled within the year. The board adjourned to meet at the call of the president.

Interstate Commission Drops Wire Investigation.

The action of the Interstate Commerce Commission in ordering the abandonment of the wire inquiry, in which connection hearings have been held until recently in Chicago and New York, is being interpreted as Washington's formal approval of the carrying out of the American Telephone & Telegraph Co. anti-trust agreement with the government. The wire inquiry began in January, 1913, and was understood to have been the result of informal complaint of the Postal Telegraph company that the Western Union Telegraph Co. and the A. T. & T. Co. were acquiring a monopoly of the business of transmitting messages. The original idea of the investigation was believed to have been for the Interstate Commerce Commission to collect data which, if it was thought proper, should be submitted to Congress or to the Department of Justice for action.

The reasons given for the dismissal of the inquiry are threefold. It is stated that the commission has only limited jurisdiction over the telephone and telegraph companies. The great cost of the undertaking and the probability that no satisfactory results would be obtained are mentioned, as well as the fact that the work of making a physical valuation of the wire systems is now under way by the valuation division.

The commission announces, however, that the abandonment of the general inquiry into rates, practices and regulations of the wire companies will not prevent it from considering such individual complaints as may be instituted.

The agreement between the government and the A. T. & T. Co. was announced several months after President Wilson took office. It provided for the separation of the Western Union Telegraph Co. and the American Telephone & Telegraph Co., and it is now reported that the Attorney General has formally approved the consummation of the agreement. The announcement of the Interstate Commerce Commission regarding the termination of the wire hearings, follows:

"The investigation by the Interstate Commerce Commission into the history, financial operations, rates, rules, regulations and practices of the telephone and telegraph companies, subject to the act to regulate commerce, has been dismissed. It was begun on January 13, 1913, after the discontinuance, just prior to that date, of the government's anti-trust suit against the American Telephone & Telegraph Co. and upon the then Attorney General's suggestion that the act to regulate commerce conferred upon the Interstate Commerce Commission powers entirely ample to enable the commission to investigate the various complaints that had been made to the Department of Justice. The commission at the time advised the Department of Justice that there was some doubt as to how far it could correct the evils that the investigation might develop.

The preliminary work on the investigation on the part of the commission progressed in the usual way until January, 1914, when it was discontinued. That action was taken because the Department of Justice had re-opened its anti-trust proceeding and had therein on December 19, 1913, effected a certain agreement, with the American Telephone & Telegraph Co. This agreement accomplished much of what was sought to be accomplished by the commission's order of investigation. Since then the Interstate Commerce Commission has informally disposed of the individual complaints which had been received and consolidated with the general investigation.

Under such circumstances and because the jurisdiction of the commission over telegraph and telephone carriers is limited and because it appeared certain that to pursue the investigation would involve the expenditure of a very large sum of money, with no apparent results that would justify that expenditure, it has seemed advisable that the general investigation should not be continued. If there are individual complaints they may be presented and prosecuted formally with more expedition and satisfaction and with very much less expense.

Furthermore, the valuation of telegraph and telephone properties has only been begun and this fact had a bearing upon the action of the commission."

Wireless Telephone on Market Soon, Claim.

"It is practically assured that during the coming year a commercial wireless telephone will be placed on the market," was a statement made to the directors of the Marconi company at the annual meeting in Jersey City this week.

Fundamental Principles of the Telephone Business

A Reading Course Designed to Present Logically the Principles Which Underlie Successful Organization and Operation of Telephone Properties —Prepared Under the General Supervision of Stanley R. Edwards—This Section on Economics of Telephony written by James H. Shoemaker

Quiz Questions on the Preceding Installment.

32. What is the relation of economics to business?

33. What is the one great fact that must be dealt with in every department of economic investigation?

34. What do telephone men want? To what does their want lead? Name an important element in the consideration of the reasonableness of a utility rate.

35. Experience of telephone men is showing the necessity for making inquiry into what subject?

36. What questions must be studied before profit can be gained from a study of rate regulation, monopoly, competition, etc.?

37. What is a tendency of the times? What matters cannot be ignored by the utility man?

38. Why should the relations between ownership and operation be considered before rates and other matters?

39. Outline two opposite extremes of ownership theories.

CHAPTER III. Ownership and Operation (Cont'd).

40. *Various Degrees of Ownership.*—During the recent session of the Kansas legislature, and also in the legislatures of other states, bills were proposed placing upon the owners of farms the same restrictions as are already placed by law upon railroads and other utilities. Whether such bills were proposed seriously, or only as jokes, does not conceal the fact that there are various degrees of absoluteness in the matter of ownership at this time. The degree of the owner's control over a farm is as different from the degree of the owner's control over a railroad or telephone system, as day is different from night. It is well, also, for utility managers to keep in mind this fact: When we talk, now, of the pros and cons of public ownership or private ownership of utilities, we are dealing with a matter vastly different from the pros and cons of the public ownership of farms. In other words, the farmer would have very much more of real proprietorship to yield than remains to be yielded up by the owners of utilities.

41. *Funds for Extensions.*—We have repeatedly contended that all telephone men learn economics in the school of hard knocks, even though they never follow a regular course of study. There are certain economic facts, factors and forces with which every telephone manager must struggle.

Our population, for instance, increases rapidly. During the ten-year census period, 1900-1910, the increase for the country as a whole was equal to all the people of the Upper Mississippi Valley—Illinois, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota and Wisconsin—if Cook county, Illinois (Chicago), is excluded from the total. If this increasing population adds but one telephone subscriber for every ten people, it will cause an increase of more than 1,600,000 subscribers every ten years—more than 160,000 every year. At the low figure of $50 each, this increase alone demands new property costing more than $8,000,000 every year. Of course this estimate is absurdly low, but it has been made low to secure that force of argument which comes from understating one's contention, rather than overstating it.

Failure to build the extensions required by this increasing population would be the economic collapse—the death—of the telephone industry. Therefore, the necessity of providing funds, with which to escape this economic collapse, compels us to face the question of ownership. Hence public ownership, as against private ownership, is apt to be determined largely, if not entirely, by the answer which experience gives to this question:

Which of the two classes of ownership will best secure the funds required for extensions and improvements?

To some this may seem a rather extreme or radical way of putting the case. But it is plain that private ownership is at an end whenever it fails to raise funds for extensions and improvements.

42. *Railroads and Rates.*—It is not wise to shut our eyes to such things as were brought out in a hearing of the Interstate Commerce Commission, at Chicago, March 6, 1915, in the matter of a raise in rates for Western roads. The following is taken from the testimony:

"Has not constant reiteration by railway presidents of their hardships, tended to hurt their credit?" asked Luther Walter, counsel for the packing interests.

"They have not spoken half bad enough," replied Mr. Lusk, one of the receivers of the St. Louis & San Francisco Railroad, who was before the commission as a witness. "Railway regulation and control is a thing which has come to stay. A man would be blind, indeed, not to see that.

"Why not do with the railroads as we do with the banks? I have known bankers who have done wrong, and when they did wrong, the Department of Justice ran them down, but the bank, itself, was not attacked. In no such case has there been any agitation against the bank itself. I have seen a whole colony of bankers in the penitentiary. In the same way, we can control and handle the railways. Why should we hurt innocent people (shareholders and bondholders of railroads)? I have seldom heard of any of the looters of railroads suffering for their crimes. By our present methods, we are just taking the money from the innocent bondholders, and from innocent employes and hurting general business. Let the railroads earn enough to pay their honest debts and then watch them as you watch the banks.

The assessed value of the Frisco, proper, for taxation purposes, is from $36,000 to $40,000 per mile. Taking the lower figure, $36,000, it amounts to a total value of $189,000,000, while we are only paying interest on one-half. We are only able to pay interest on about half of that assessed basis of capital, after paying taxes and operating expenses. Taking the lowest estimate of which I have heard, a little less than $50,000 per mile, the valuation would be $250,000,000, including terminals, yards, buildings, stations, equipment, track, real estate and all

On this basis, the interest which we are able to pay is equal to only 1.7 per cent.

There is no doubt that this condition has been brought about by:

(a). A rise of 100 per cent. in taxes per mile in the last 10 years.

(b). A rise of 32 per cent. in wages in the same length of time.

(c). A rise of 36 per cent. (approximately) in the cost of material and supplies.

In the same period of time, (a) passenger rates have gone down from 3 cents to 2 cents and there has been (b) a considerable decrease in commodity rates for freight."

It might be said that, in the family of railroads, the Frisco is one of the "black sheep" or one of the bad boys. It must be observed, howevr, that it is an officer of the court—a receiver, appointed by the court—who says he is unable to make the road pay as much as 2 per cent. above the cost of operation and taxes. If it be argued that this is an exceptional circumstance, let us turn to testimony on the same day by Expert Accountant Wettling. His figures covered roads whose mileage of all tracks had risen from 86,255 miles in 1901 to 138,277 miles in 1914, and his statement says:

On a per mile basis, the earnings in 1901 afforded 7 per cent. on only $30,525 per mile, whereas in 1914, though the roads had, in the meantime, spent many millions in betterments, they averaged a return of 7 per cent. on only $28,048 per mile. So, with all the millions spent meanwhile, they earned 7 per cent. on about $2,500 per mile less in 1914 than they did in 1901.

The ratio of operating expenses and taxes to gross revenues, rose from 68.14 per cent. in 1901 to 78.81 per cent. in 1914. . . . Net income for every dollar of investment for the period 1901-1907, was 4.96 cents, but for the period 1907-1914 it was only 4.19 cents. Increase in operating revenues was 7.29 per cent., but net operating income decreased 15.52 per cent.

Even the opponents of the requested rate raise seem to admit some of the force of the argument thus presented. In rebuttal, they argue that the decline of the later period is due, in part, to the fact that the roads have "charged off" a larger portion of income to depreciation than formerly. The roads objected to the demands of the Interstate Commerce Commission that they take out a fixed amount monthly for this item of depreciation. It seems rather a weak argument, therefore, to ask them to live in the future upon the mere memory of the fact that they over-estimated their net earnings in the past.

One opponent of the railroad rate raise says a certain road should be condemned for "charging off" to depreciation an amount equal to 7 per cent., which he claims is too much. On the other hand, he claims that another company is wrong because it "charged off" less than 3 per cent. to depreciation.

43. *Railroad Profits and the Public.*—These foregoing points are mentioned because, in the opinion of the author, they show conclusively three things:

(1). There is a strong popular inclination to force the railroads to experiment with such matters as depreciation for the benefit of the public, but at the risk and possible expense of the private owners.

(2). The gross amount in controversy between the private owners of the railroads and their antagonists is evidently not more than 4 per cent. on the admitted valuation of the properties.

(3). There seems to be little, if any, public determination to reward the highest efficiency of management. The popular purpose seems to be to keep the best managed lines down, as nearly as possible, to the rate of return paid for government loans, leaving all the roads, which are below the best management, to fail financially.

During a single day, the author heard a grain buyer, who is also a legislator, speak approvingly of his own grain business earning "400 per cent. profit in five years," and disapprovingly of the "robber profits" of the railroads and other utilities.

44. *The Real Issue.*—It might be said that as telephone men, we are not interested in the declining powers of the railroads to attract the capital they need for extensions and improvements. It might be contended that we are only interested in getting capital for the extensions and improvements of telephone plants. To this, two answers seem to the author to be pertinent:

First: Telephone men are now under the control of the same regulative body to which this appeal of the railroads is being made. Telephone men are becoming more and more interested in the general effect which regulation will have upon their own power to secure the required new capital for the telephone business. While this is a matter which must be treated more exhaustively under a discussion of regulation, there is an important relationship between regulation and ownership. Therefore, it is held that the effect of regulation upon ownership, as proven by the experience of the railroads, is pertinent to our present consideration of the ownership of telephones.

Second: In the recent annual report of the American Telephone & Telegraph Co. may be found certain straws showing the effect of regulation upon the earnings of telephone companies. Let us bear in mind that both the railroads and their opponents agree that the decline in the interest-paying power of the roads is due, in part at least, to "charging off" to depreciation a larger amount in later years than formerly. Many telephone companies will encounter exactly this same difficulty. They will be compelled to make provision for a larger depreciation allowance in the years to come than was made by them in the years of the past. Then let us consider the published figures of the A. T. & T. Co.:

A. T. & T. current maintenance and depreciation for the year 1907 was	$36,626,700
A. T. & T. current maintenance and depreciation for the year 1914 was	73,091,628
Increase	$36,464,928

During the same period, the figures covering the cost of plant increased only 78 per cent., whereas the deductions for maintenance and depreciation increased 100 per cent.

Let it be assumed that certain of the larger companies more especially, saw, in the beginning, the importance of setting aside a sufficient reserve for maintenance and depreciation. Assume that they made provision for this need long ago, and take it for granted that few, if any, of the telephone companies will ever suffer such extreme embarrassment as is shown by the testimony of the receiver of the Frisco railroad. This same annual report of the A. T. & T. Co. shows on its books surplus and reserves amounting to $128,643,094 and a physical value of its plant, which is some $61,000,000 more than the book value.

Under such circumstances a decline of a million, more or less, in its total surplus is far from an interference with the ability to attract capital. Nevertheless, out of earnings for 1914, this report shows a "balance for surplus" which is $1,-

732,742 less than in 1913 and $2,522,148 less than in 1907.

Receiver Lusk testified that in his opinion the managers of railroads had not been frank enough in making known the effect which regulation was having upon them in the past. "They haven't spoken half bad enough," said he. In this matter of protecting their power to attract capital, it will be exceedingly fortunate for all concerned if many of the larger companies are able and willing to disclose actual encroachments upon their surplus earnings for one or more years before such encroachment actually prohibits the payment of the necessary dividends.

It would be very difficult to conceive of any other equally effectual method for keeping up the ability of telephone companies, in general, to secure the required standard of rates with which to attract needed capital.

(To be Continued)

Loading Coils—Principles, Design and Construction

Design of Aerial and Cable Types of Loading Coil Cases—Factors Entering into Design—Assembly of Coils in Cases—Methods of Bringing out the Connecting Wires—The Submarine Case and Difficulties Encountered—Concluding Installment

By W. N. Furthmann

The first aerial loading coil case in service was a wooden case about three feet square. This case contained a coil of copper wire, completely impregnated and covered with a resin and resin oil compound. It was the first type of loading coil manufactured under the American Telephone & Telegraph Co.'s specifications and represented the initial effort to put into use the tangible result of Dr. Pupin's invention. These coils and cases were manufactured and installed about June, 1899. This was a year previous to the issue of the patents on the iron core type of loading coil, an advanced step in the art.

A copper wire loading coil, divided into equal sections having approximately equal windings about an air type core, with a minimum amount of cross talk and installed in a wooden or other non-magnetic alloy case, represents what might be termed an ideal type in the design of loading coils and cases. The manufacturing and installing cost would be considerably less than with the iron core type with its cast iron case. Such a coil could not become magnetized to any material extent. It would be possible to reduce the cross talk in such a coil materially lower than is now obtained, even in what is now known as the high efficiency type of coil. In a non-magnetic case, the coil would be free from eddy current losses and its effective resistance would be almost its direct current resistance.

A coil and case of this ideal design would have the following faults: More copper windings are required than in coils of equal inductance having iron cores. A non-metallic case of wood is subject to rapid deterioration and high maintenance expense.

The market price of copper would be the influencing factor of the first fault. A non-magnetic aluminum alloy case would, under certain limitations, be an apparent cure of the second. A non-magnetic case for aerial service is not a satisfactory solution of the problem, because of the inductive disturbance due to adjacent high potential currents. The wearing qualities and tensile strength of an alloy case also are somewhat uncertain quantities.

In cable cases the cost of space is a very important and also a difficult problem. The question of space in cable service also requires as many coils as good mechanical construction permits in each case and that the case casting shall be of the highest possible tensile strength. Possible high maintenance expense accounts, present greater problems in underground service, than any question relating to reduction of installation costs.

If the designers of the original type of loading coil, and its case, had in mind its several natural advantages, credit should be given them for apparent foresight in avoiding obstacles which are still vexatious problems to the development telephone engineer. He is still striving to find their solution in what is now known as the high efficiency coil and its case, and yet maintain the many advantages obtained with the iron core type of coil and its iron case. From electrical tests which he has made, the writer is very certain that in the original design of loading coil and its case, the problem of cross talk must have

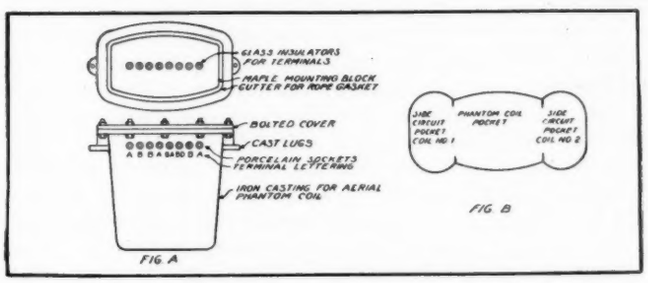


Fig. 1. Phantom and New Type of Aerial Cases.

received but little attention, as the coils tested were found to contain six or seven times the amount of cross talk found in the preliminary design of iron core type of coils.

Two types of iron core loading coil cases now used for aerial service are illustrated in Fig. 1. Only one coil is installed in the case shown in Fig. 1-*A*, while three coils are assembled in the case shown in Fig. 1-*B*. A large number of the cases illustrated in Fig. 1-*B* is installed in the new transcontinental line and that type may therefore be said to represent the most modern design of aerial case for loading coil service.

The aerial type of case is, of course, subject to very severe weather conditions. When it is realized that the coils may be exposed to the ice and snow of a mountain range or, on the other hand, to the desert sand and sun, it is seen that the engineering problems involved are very difficult to overcome. It has been found that wide ranges of temperature, either of heat or cold, have a tendency to materially affect the amount of cross talk that a coil may contain.

As the coils are manufactured for promiscuous shipment, due to the expense which would be involved in designating the location for each particular case, it is evident that the design of a loading coil case and its method of assembly is a most important feature of the efficiency of the coil. Great care, therefore, is used to obtain an excellent grade of cast iron. The cases are very exactly machined to fit evenly with the cover. The castings are given an air bubble test for the purpose of discovering the presence of sand holes. They are then placed in a bath of asphaltum compound. On account of the importance of these operations, a rigid mechanical inspection is necessary for each operation.

The raw materials used in the impregnating and covering of the coils, as well as the asphaltum cement used in sealing

the case, are also of vital importance in determining its proper maintenance. These compounds must therefore not only be properly mixed, but must also be held to a rigid specification for melting point and cold flow.

After the coils are placed in the case, a cedar block, exactly fitting the case, is placed above the coil and the terminals of

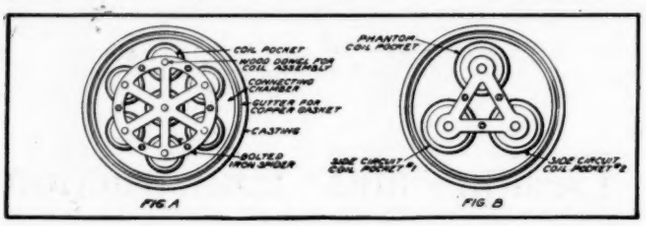


Fig. 2. Top Views, Non-Phantom Cable and Phantom Coil Cases.

the windings brought out through glass bushings in the block. Copper terminal wires are connected to the winding terminals and are brought out through porcelain bushings placed in the side of the case. No. 14 B. & S. gage, triple insulated, double braided, rubber covered wire is generally used for bringing out ten-foot terminals. Above the holes through which each terminal projects, a designating letter is cast on the case, so that each terminal can be quickly and exactly located after the coil is installed on the pole. The case is sealed with an asphaltum compound, a tar rope gasket being used when the cover is bolted in place.

In Fig. 1-*B*, it will be noted that the case is arranged for three coils. These coils constitute what is known as a unit of loading, which is comprised of a phantom coil and two side circuit coils. It was formerly the practice to install the three coils in separate cases. It was thought that by this practice their weight would be evenly distributed on the arms of the pole. It was found, however, that in the design of the high efficiency coil, its electrical constants, and especially cross talk, depended upon a minimum amount of wiring. Even though the three-coil case was a good example of unevenly distributed weight on a pole, the urgent need of immediate electrical efficiency outweighed its objections from a mechanical standpoint.

The same methods of assembly and bringing out the terminals are followed in the manufacture of the three-coil case as are used in the single coil case. Considerable wiring that was done outside of the cases is now, in connecting the three coils in the circuit, accomplished inside of the three coil case. The number of the terminal leads to the insulators and lightning arresters is therefore materially reduced. In proportion, also, the intimate dangers of high potential currents and the number of delicate exposed parts to insects, vermin and weather are reduced. Hence many causes of maintenance expense are eliminated in transcontinental service at a saving of many dollars per minute valuation.

Cable Loading Coil Cases.

Loading coils for cable service are generally assembled in cases that are to be installed in vaults underground. This is

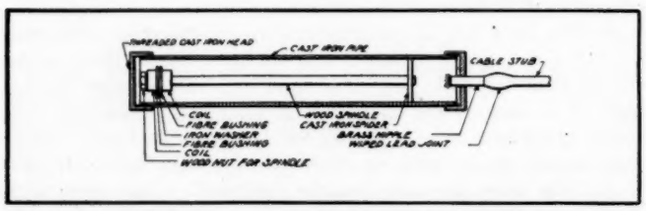


Fig. 3. Pipe Type Case for Universal Cable Coil Service.

particularly the case with loading coils which are to be used on incoming toll lines and the long trunk lines extending through and around the large cities of the country. It has also recently become the practice to place toll trunk lines between large cities underground, especially where periodical storms are more severe for that particular locality than other adjacent locations. The loading of the transcontinental line furnished additional argument for the necessity of underground installation in these places.

While cable loading coil cases, installed underground, are not exposed to lightning and other atmospheric conditions, they do receive more severe exposure to water and other reactive agents, such as sewer gas, acids and electrolysis. The method of installing cable loading coil cases also subjects them to more severe handling than is received by an aerial type of case.

The type of case used for the assembly of the non-phantom type of case for city trunk service is shown in Fig. 2-*A*. Fig. 2-*B* illustrates the type of case used for the assembly of cable coils that contain a unit of loading. The single spindle or pipe type of case is illustrated in Fig. 3. This case may be designed for either phantom or non-phantom coils, or it may be arranged to contain units of loading.

These three types of cases are the representative of the types used. The patterns are so designed that various degrees of length may be obtained depending upon the size and type of coil it is desired to install. The method of assembling the coils on the dowels, the design of dowels, and the method of clamping them in place by means of an iron spider, have been standardized. The method of cabling the coils on the dowels and also of connecting the outer cable stubs, have also been standardized. Hence a description of the various methods

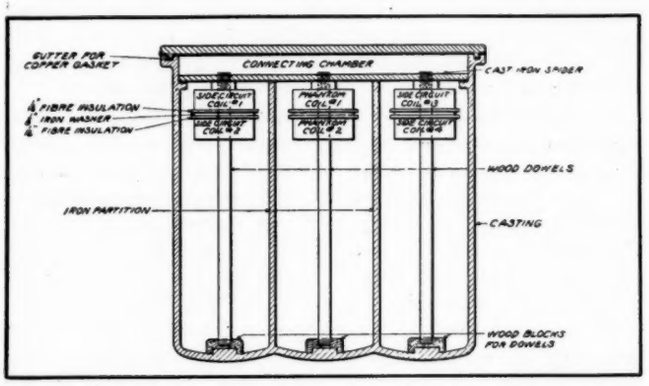


Fig. 4. Phantom Cable Case for Units of Loading.

used in assembling one type of case will give a general idea of the entire subject.

The general mechanical requirements previously described under aerial cases also apply to cable loading coil cases. These cases are considerably larger and also very much heavier so that more care and expense is involved in the preliminary operations of their manufacture.

After the coils are baked and impregnated, they are assembled on wooden dowels as illustrated in Fig. 4. It will be noted in this illustration that the wooden dowel is threaded at both ends. A wood nut is used for clamping the lower end at the bottom of the case while at the other end another one is provided for separating the coils from the spider. The dowel is held firmly in place by means of a set screw in the spider. The provision of the wood buffers between the coils and iron case is very important, because the iron walls of the case are a great menace to the efficiency of the coils. This is not only true of the eddy current losses but also of the breakdown test of 1,000 volts alternating current applied to these coils. It is because of these conditions that it has been found impossible to use iron dowels for the coils, even though the use of wood dowels is open to question as to their mechanical strength for sustaining, in some instances, 14 coils per dowel.

The coils when assembled on the dowel are staggered as regards the section washer insulators. The coils are staggered so as to separate as far as possible the magnetic poles located at the both ends of each section of the coils. Two fibre wash-

ers with an iron washer between them are placed between the coils. The iron washers are used as magnetic shields between the coils and the fibre washers are intended as insulators for the iron washer.

When non-phantom coils are assembled, they can be placed at will along the dowel. When side circuit phantom coils are assembled, they are arranged in pairs as they are to be connected to a particular phantom coil. In some instances, the phantom coils may be installed in separate pipe cases. The wiring connections would then be made outside of the case. The phantom coils are, in some types of cases, installed in the same case. It is then the practice to connect the two side circuit coils to a phantom coil located in the same plane on the phantom coil dowel.

After the coils are properly assembled on the dowels, they are connected to dowel cables made up of No. 13 or No. 16 B. & S. gage quadded wires having double silk and cotton insulation. Care is used in assembling these quadded wires to preserve a uniform length of twist in the wires, as it has been found that a considerable amount of cross talk, due to unbalance capacity, may be added to the resultant cross talk of a unit of loading thus connected. These quadded wires also have a definite color scheme, not only to provide for their definite location on the dowel and to obviate any danger of connecting the coils improperly to the phantom coil inside of the case, but also to retain their definite identity after the outer cable stub is connected and the case sealed up with the cover bolted in place.

Some idea of the problems involved, not only from a color scheme but also from a mechanical standpoint, may be obtained when it is remembered that there are eight leads from each phantom coil and four leads from each side circuit coil; also that there are seven to fourteen coils on each of the three dowels. The dowel cables being properly connected, one on each side of the dowel, the dowel of coils is completely wrapped in two layers of varnished linen as an additional electrical protection from any possible contact with the walls of the case. After the dowels have been installed, the case is laid on its side and an outside cable stub, 15 feet long and complete with a ⅛-inch sheath, is connected to the dowel cables.

These connections were at one time made with a twisted splice and then very thoroughly taped. It was found, however, that such a large mass of metal imbedded in a flowing mass of insulating material, was subject to severe contraction and expansion, causing open connections and crosses in the adjacent quads. These connections are now made with a copper connector, which is slotted so that the connections can be

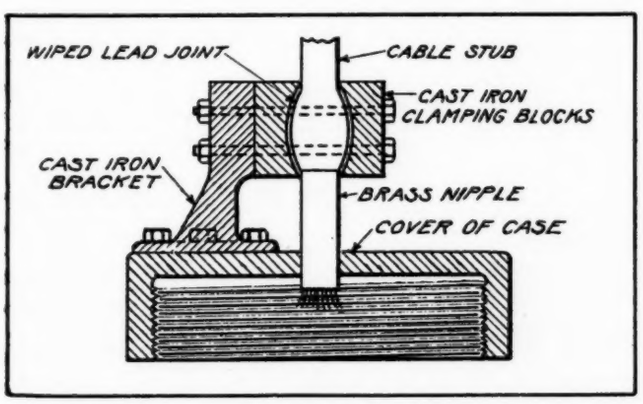


Fig. 5. Clamp for Cable Loading Coil Cases.

made and soldered without twisting the conductors. A large number of these cases so connected have been installed and the writer does not know of trouble being encountered.

After the case has been assembled and filled, with the cover in place, it is now the practice to equip it with a cable stub bracket made of iron as shown in Fig. 5. It will be noted that this bracket consists of two iron clamping blocks and a supporting iron bracket. These supports are designed to prevent any shifting of the cable stub at the nipple. The necessity for this protection is that inside of the case is a large invest-

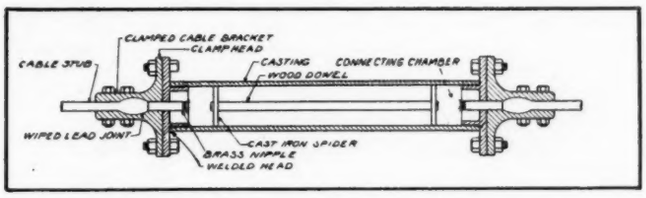


Fig. 6. Submarine Loading Coil Case.

ment. A slight crack in the sheath at the nipple, which might be caused in a good many ways, and the entire investment is gone. This phase of loading coil case design was brought forcibly to the writer's attention during the installation of the New York-Washington loaded cable. The cases for this section were not equipped with cable stub brackets. They were somewhat hurriedly located in the holes in the ground—not in vaults—along the Potomac River. The river overflowed shortly after the cases had been spliced in and then, and only then, were cracks found at the nipple.

These cases were valued at approximately a $1,000 each and had to be shipped back and forth across the country by express. It is therefore good engineering to insure the life of a $1,000 case with a $2 cable stub clamp.

While loading coil cases for both aerial and cable service are now designed to be practically waterproof, even though they are entirely immersed in water, there are many mechanical reasons why these cases would not be entirely satisfactory for submarine service.

A general idea of the design of a loading coil case used in the United States for submarine service may be obtained from Fig. 6. It will be noted that the cable stubs extend from both ends of the case instead of from one end only as in the underground cable loading coil cases. It will be noticed that while the method used for sealing the cases is adapted to the special features of a submarine case, the method of assembling the coils on the dowel is identical with that used in assembling cable loading coil case.

The filling and sealing of a submarine type case is a very difficult operation. The sealing operation must take place after the heads of the case and cable stubs at each end, are in place. It will be readily apparent therefore, that the only satisfactory method of filling and sealing the case is by means of a vacuum pump. One cable stub is inserted in the compound and the vacuum pump is attached to the stub at the other end. The success of such a method depends not only upon having the compound at a proper consistency, but also upon a careful computation of the capacity of the case.

If the compound does not flow freely, it will have a tendency to gum, filling up the air passages between the quads of the cable stub. This will entirely block the filling operation and require the placing of a new cable stub. While it is possible to apply heat to the case to assist in the flow of the compound, its application to the cable stub would only injure the cable stub sheath. The application of heat to any sealed case containing insulating oil, is also a dangerous operation. This is especially so where the filling compound is made up of ingredients containing gas-producing elements upon application of heat. As it is a difficult operation to introduce the compound into the case, the avenues for the escape of over-heated gas must be necessarily very small. The danger of blowing out either or both of the heads, in an enclosed or crowded space, makes the filling of a submarine case under these conditions, as hazardous, almost, as any other submarine operation, even where gun cotton is used.

In the design of a submarine case, particular care must be

taken, from an engineering standpoint, in determining not only upon its form but also upon the raw materials which are to be used on its construction. Where a submarine case is to be installed with several miles of cable attached to each end, the most desirable type and probably the most efficient, is that which is similar not only in form but also in construction to

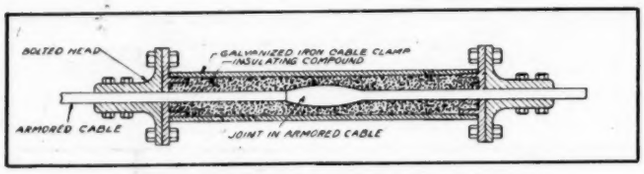


Fig. 7. Clamps for Submarine Armored Cable.

the submarine cable used in connection with it. The importance of obtaining the most efficient method of protecting the splices at both ends of the case will also be readily apparent. In Fig. 7 is shown the method used to protect the submarine cases now installed in the bed of Chesapeake Bay. This is the only case of its kind now being used for submarine loading coil service.

Several changes have recently been made in an attempt to improve the method of sealing the heads but in almost all other respects, the original design is still being maintained. The first two coil cases installed in Chesapeake Bay, had casings of wrought iron pipe completely wrapped with rope oakum thoroughly saturated in a tar compound to minimize as much as possible the destructive action of the salt water. These cases would, no doubt, have given a good many years of service. The anchor of a battleship, however, became entangled in the armored cable attached to the case, and a heavy sea being on, the toll lines between Washington and Wall Street were soon full of water.

When the new cases were installed, it was decided to use one-inch tube steel and to endeavor to improve the efficiency of sealing the cases as shown in Fig. 8. It will be noted that the case has an inner and outer head. The inner head was sealed with lead and oakum. The outer head was sealed by means of welding similar to the method used in the old case shown in Fig. 6. While the new cases have two means of protection against one in the old type, it will be seen that it would be impossible to test such a case as satisfactorily as the old type.

The process of welding is uncertain and unless the weld can be subjected to air pressure, equivalent to the pounds pressure to which the weld is to be exposed in service, no assurance can be given that it will stand up under the conditions it is supposed to meet. Where several miles of expensive cable are to be installed, the engineering importance of predetermining its efficiency from a leakage standpoint, is of paramount importance. It will be noted in Fig. 8 that if the outer head is welded properly, no air test can be made of the lead-sealed head by the same test. It will also be readily seen that, if the lead

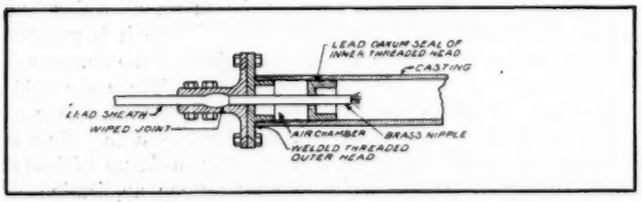


Fig. 8. New Type Double-Head Submarine Loading Case.

seal is properly made, an air test of the welded seal by the same test would be an impossibility.

The only other submarine coils in service are located in Lake Constance, Switzerland, and in the English Channel between England and the Continent. These coils are designed so that they may be assembled in the cable proper without the necessity of placing the coils in a case. These coils are not in any way similar in design to the coils used in the Boston-Washington line. While their electrical efficiency is said to be equivalent to the coils manufactured in this country, the coils are designed so that the windings are not applied in sections. It has been previously pointed out that only by winding loading coils in sections, can cross talk, the most objectionable defect of a loading coil and a loaded cable, be reduced to that minimum where its presence while known, is free from any detrimental properties.

Ohio State Company to Make Extensive Improvements.

One of the most extensive improvement programs ever inaugurated in the Independent telephone industry is now being carried on and pushed to completion by the Ohio State Telephone Co., of Columbus.

The executive committee of the company has just voted for an additional expenditure of $136,516 for extensions and improvements, not included in the previous estimates. Of this sum an appropriation of $96,000 has been made for the rebuilding and extension of the plant of the company at Alliance, including the installation of automatic equipment.

Approximately $25,000 will be spent in the construction of 228 miles of long distance circuits from Springfield to Bellefontaine, Canton to Bellefontaine, Toledo to Fremont, and Columbus to Sunbury, Urbana to Bellefontaine, Crestline to Bucyrus, Columbus to Mount Gilead. This is in addition to expenditure of $35,000 for additional long distance lines in other parts of the state as voted by the committee several weeks ago.

The committee also provided an expenditure of $12,750 for additional cable distribution capacity in Akron and $2,000 for underground construction in Canton.

The plant at Youngstown is being rebuilt at a cost of approximately $450,000.

In Columbus $50,000 is being spent in the east end for cable equipment and underground construction, and an additional expenditure is contemplated in the north end of Columbus.

In Dayton probably $50,000 has already been expended in Oakland, and more is to be spent in the near future in other parts of that city, including the installation of an automatic sub-exchange.

Affairs of the Inter-State Company, of Aurora.

According to a report in a Chicago newspaper this week the time limit for depositing with the Northern Trust Co., of Chicago, the stock, bonds and trust equipment notes of the Interstate Independent Telephone & Telegraph Co., of Aurora, Ill., for sale to the Bell interests has expired and sufficient securities have been deposited to make a sale practically certain.

The Bell interests now own 51 per cent. of the stock, 54 per cent. of the bonds and 70 per cent. of the equipment trust notes. The capital stock is $2,447,660 and the bonded indebtedness $2,500,000.

A contract was secured with the Bell company to purchase the rest of the outstanding securities if 90 per cent. of the three issues were deposited by April 15. Holders of trust notes have deposited 96 per cent., bondholders have offered over 90 per cent., but the stockholders, being offered but $4 a share, have not produced 90 per cent.

It is now considered probable that the Bell company will buy the bonds and equipment trust notes at the contract price, $46 for the bonds and $70 for the trust notes. It is probable that the stockholders, having failed to come in, will be left to shift for themselves under a foreclosure.

Consent of the Illinois Public Utility Commission to the transactions is said to be assured by the fact that the security holders, through a committee, are asking the sale as a measure of relief. The consent of the Federal authorities also is said to be assured.

When Doctors Disagree

A Bank Row—Efficiency a Predominating Factor

By J. C. Kelsey

It is usually comforting to know what the other fellow is doing.

In our telephone lives, we wax eloquent over our wrongs; we think we have more trouble than any other industry. We are in a contest here over compulsory physical connection. We disagree there over the qualified toll agreement. And we vigorously protest at the unfair advantage of the Bell factory exclusive alliance.

We earnestly believe that the Bell company is abusing its charter rights as a public service concern when it barters to the disadvantage of private and unprotected enterprise.

On the whole, it looks sometimes as if our days are really full of trouble.

We have no monopoly on this condition at all. There are other institutions so deep in trouble that our hardships seem easy to bear. A particular institution is none other than a bank, the barred windows of which always remind one of oppression, slavery, or some brand of restraint.

Those of you who have been in the market for telephone switchboards know something regarding the particular institution I have in mind. You have been deluged with telegrams from divers institutions urging you to accommodate this or that concern by buying a switchboard from the Bell factory.

The Bell factory, not content with the pressure of mere salesmanship, seems to rely on the force of big business to terrify the small man. Fear of banks is only a relic of witchcraft.

One of the favorite offenders along this line of Christian endeavor is the National City Bank of New York. It is the largest American bank and has $300,000,000 in deposits —truly a giant in American finance, but really a pigmy in European financial circles.

I once took issue with the president of this bank, calling his attention to the injustice of sending such telegrams, as well as the cowardice of its position, and that of the Bell factory as well. I was curtly informed that the aforesaid president could attend to his own business. I could not answer such a chide, for I was stunned with surprise to learn that the largest bank in America took as much pleasure in the sale of a switchboard to Independent telephone men as the Bell company itself. Wonders never cease.

This great New York bank, the largest in America, emulated the great Napoleon inasmuch as there was nothing too large or too small that it would not indulge in.

Naturally, in addition to helping the Bell company sell switchboards, it helped to run the government. So zealous was this concern that it is said to have had a desk in the Treasury Department, thereby getting first-hand news and, of course, making use of it to the advantage (?) of others. It is a Wall Street habit to help others you know.

Now the greatest American bank did not dare to have one of its own men sit at this desk—but the Riggs National Bank, of Washington, D. C., did have.

When the Wilson administration began its life, one of the first things the Secretary of the Treasury is said to have done was to throw this desk into the street. Naturally, the great ally of every trust felt aggrieved at the action of the government. They naturally were pained at such base ingratitude. And we are surprised now to learn that the public has been abused by the elimination of the little roll top desk in the Treasury Department.

With a desk in the treasury, its owners naturally had a large place in the affections of the government. As a result, great deposits of public money were placed in its coffers. The Riggs National Bank, of Washington, D. C., therefore had an opportunity of piling up a surplus just two times its capital stock, and paying presumably some handsome dividends as well.

Everyone seemed to be happy, and not a word was said about the wrongs of the public. As long as the Riggs National Bank, of Washington, D. C., got its share or more, even the babies gurgled with pleasure, while the public sang from morning to night. The country was safe.

The first thing the cruel administration did after evicting the desk and its occupant from the Treasury Department, was to begin to withdraw $1,200,000 of government deposits. The worst part of it was that the unfeeling government officials withdrew two-thirds of this money last fall when the banks, in their fright, had jumped into their storm cellars.

The stock exchange was closed, and it was an awful hardship to realize money on the bonds which secured these deposits. Now, after inflicting these hardships upon this suffering bank, they began to ask questions about the past history of the bank.

This, apparently, was too much. The bank has now gone into court, denying the right of the government to ask questions which might prove embarrassing.

You remember only a few years ago that some of our great predatory money barons were so respectable that they refused to answer questions. The public was dared to invade the sanctity of their souls. Somehow this great hypocritical cloak of respectability failed to conceal hideous details, and the merest child knows that this bluff has ceased to work.

Aside from the little desk in the Treasury Department, the withdrawal of funds and whatever personal animosity there may be, there is a bigger question involved. We know something about it in the regulation of public utilities.

Having been so long immune from investigation, it comes hard for some to submit to close questioning about their business. No public utility commission hedges itself about with so much power as the United States Treasury Department.

It was only last year that the Treasury Department asked the power to remove any director of a national bank without trial or judical procedure. Further, it wanted the power to fine any officer of a national bank, who disobeyed any regulation, and possibly to have him shot if he belonged to the opposite party.

No public utility commission has ever asked for such authority.

Many telephone men will find themselves familiar with the complaint of the Riggs National Bank, of Washington, D. C.—one of the children of the largest bank in America:

When an official abuses the function of a great office, exceeds its lawful power, and uses the authority and opportunities of the position, especially in a persistent and evidently determined attempt to injure an institution committed to its care, to drive business from it; *to burden it with useless and irrelevant demands and unnecessary expense;* to impose unjust and oppressive fines; to force competent and trusted officers from the positions in which they have faithfully served the institution—there is an obligation, not only on behalf of the individuals who are personally assailed and the stockholders whose property rights are threatened, but *on behalf of the public* which requires that resistance shall be made and such abuse of official powers shall be exposed.

I have heard many telephone men make almost an identical complaint. There is no question that the establishment of regulation has imposed "useless and irrelevant demands and unnecessary expense." Our loophole, as a public utility, is that there is no law which deters us from calling this charge a current expense, and allowing the public to pay it in the form of an increased rate.

No commission can compel us to lose our jobs, yet they can make us glad to lose them. They can get even with any public utility organization. They can exceed their lawful powers. But no one can say that we have real cause for complaint unless it is too much delay in getting decisions. That is not to be wondered at when you know that one commissioner will sometimes hear five cases in a day.

The weakest part of the government's case appears to be that the investigations seem more for the purpose of injury to the bank than for the benefit of depositors and patrons. However, it remains to be proved.

We have had that in the telephone business. We have had decisions which seemed written for the purpose of crippling rather than helping the company involved.

There seems to be no justice in going back to the birth of the company, unless it is for the purpose of studying the losses of the early development period. Nor does there seem to be any good judgment used in suddenly asking a man to explain a transaction made ten years ago. If a man had but one transaction in his life to explain, it might be possible.

Anyway, the object of the story is to show you that telephone men have no monopoly on troubles. We are undoubtedly happier because the government, as well as the largest American bank knows so little about us and has so little respect for us. We cannot say that we do not know bankers, because nearly every Independent telephone company in America has direct dealings with banks that respect their business and treat them fairly.

We do not need desks in the Treasury Department, nor one in the Attorney General's office. We can get along with or without telegrams from respectable banks. We have survived by the sole reason of our inherent strength and vitality.

The real underlying contest between the Treasury Department and the Riggs National Bank, of Washington, D. C., really interests us. Our public utility commissioners are taken from civil life. Most of them are lawyers and they know little or nothing about our troubles. They do not profess to know either.

The general feeling about the bank row is that the so-called despotism of the government is due to the inefficiency or ignorance of the banking business on the part of the officers. It is very likely that an officer with little knowledge, is more apt to call for a mass of irrelevant detail and be greatly alarmed by it, than a man who knows the business.

It seems to be the law of the universe that all industry must be controlled by men who know nothing about it. The theory is that a telephone man on a public utility board would lean toward telephone companies, and neglect the public rights.

By the same token, a big banker could not, today, have charge of the Treasury because he would neglect the public. It means that every four, or eight, or sixteen years a new bunch of Federal bank officials will have to be taught something about banking—just as in our life a new public utility commission must be educated too often for efficiency's sake.

Talking about efficiency, I have a letter from one of the biggest telephone men in our Independent circle. He is a self-made man who had little opportunity, yet by reading, observing and studying, kept growing until a condition called for him.

He recently wrote us that 150 of his employes had subscribed for TELEPHONY to get the benefit of the Home Study Course. This man, remembering his love and need of reading and study, offered to pay half of the subscription price for every man who came forward.

We are sometimes inclined to be lazy, and say to ourselves that there is no use of studying or making any effort. We often say that men only get large positions by reason of pull.

There never was a time when there was such an opportunity to the man who reads, observes and studies. The very reason that this able telephone man has his place in the business world today is because he was hungry for information. Had he not stored his mind with the best telephone literature, he would today be a lineman instead of a vice-president and in control of many millions of dollars' worth of property.

Efficiency is the watchword of today. It is the cry of the largest as well as the smallest, industrial force.

The study of today is the elimination of waste. The studious employe will save life, money and material, because he makes everything count. The man who makes things count is always the natural selection—make up your mind to that. Pull never helped a man but temporarily, if at all.

Every telephone company can pay itself tenfold by taking such an interest as indicated by 150 men in one company subscribing for TELEPHONY. No better investment of $225 has been, or ever will be, made by a telephone company.

The largest bank in the United States can do better by practicing real efficiency than by having a desk in the Treasury. And so can the smallest telephone company. We do not need to rely on artificial support.

I never saw a telephone man who did not seem interested in his business. I know telephone men in the smallest companies, who have saved their properties simply by knowing what their neighbors do.

Studying, observing, and reading is within the reach of every man. If the man does not realize it, the company itself should feel responsible for such inactivity on its employes' part.

I am not trying to spread TELEPHONY's circulation for business purposes, for one copy on the manager's desk is just as valuable to our patrons as 151 subscribers in the

company. But it is valuable to every one of us when every man in the telephone business realizes that he has in his knapsack a magnate's chance.

Napoleon said that every soldier carried a marshal's appointment in this baton—and there is no fiction about its application to our employes.

I wish every telephone company in America would awaken to the idea of helping its employes to study, read and observe. The Bell companies are doing it without exception. Each company has eagerly distributed limited copies of the Home Study Course to its employes.

We surely have no right to sit back and refuse to compete with them in intelligence, as well as telephone service. Just remember, you do not need a desk in the Treasury. Just think and read.

Depend upon your natural resources. Then you will never have need to have your desk removed, your deposits reduced and be compelled to go to court to cover up your weakness.

MORAL: Efficiency has a natural foundation.

A. T. & T. Quarterly Report Shows Increase.

The American Telephone & Telegraph Co. has issued its report for the quarter ended March 31, 1915, compared with that of the previous year, as follows:

	1914	1915
Dividends	$ 6,295,409	$ 6,306,104
Interest and other revenue from associated companies	3,634,392	3,445,001
Telephone traffic (net)*	1,496,654	1,570,773
Other sources	137,548	272,616
Total earnings	$11,564,003	$11,594,494
Expenses	1,330,572	1,317,798
Net earnings	$10,233,431	$10,276,696
Deduct interest	2,048,670	1,876,606
Balance	$ 8,184,761	$ 8,400,090
Dividends paid	6,892,550	6,968,760
Balance	$ 1,292,211	$ 1,431,330

*One month estimated.

The report of the entire Bell system in the United States for the two months ended February 28, with all duplications including interest, dividends and other payments to the A. T. & T. Co. by the associated companies excluded, is as follows:

	1914	1915
Gross earnings	$36,476,470	$37,732,280
Expenses:		
Operation	$13,201,815	$13,453,436
Current maintenance	5,158,670	4,635,587
Depreciation	6,275,816	7,094,523
Taxes	2,033,036	2,164,067
Total expenses	$26,669,337	$27,347,613
Net earnings	$ 9,807,133	$10,384,667
Deduct interest	2,984,156	3,196,216
Balance net profits	$ 6,822,977	$ 7,188,451
Deduct dividends (estimated for two months)	5,065,988	5,200,139
Surplus earnings	$ 1,756,989	$ 1,988,312

Pittsburgh & Allegheny Company is Prospering.

The activities of the Pittsburgh & Allegheny Telephone Co., of Pittsburgh, Pa., since the property was turned over to the stockholders, in June of last year, and the new developments that have been planned and partially completed under the new management, are of such an extensive nature as to cause favorable comment among the telephone-using public of Pittsburgh and vicinity.

The company already has planned and carried out some of the new developments. A new exchange at Oakmont, Pa., with the modern and up-to-date switchboard facilities and instruments was completed recently and adds an entirely new exchange to the system.

The Bellevue and Sewickley, Pa., exchanges in the Ohio Valley also have recently been equipped with new switchboards and instruments of the latest type, and the campaign for new subscribers in all three of these exchanges has been conducted with success. It is estimated that the number of Independent telephones in five states reached by the Pittsburgh & Allegheny telephone system is between 800,000 to 900,000. The company has adopted a slogan since the beginning of the year, "10,000 more telephones by December 31, 1915," and from present indications, this aim will probably be realized.

Keystone Quarterly Statement Shows Increase.

The comparative statement of earnings of the Keystone Telephone Co., or Philadelphia, Pa., for the combined companies shows an increase of $4,072 in gross earnings for the month of March over the year previous. The comparative statement for the three months ending March 31, 1915, also shows an increase of $7,419. The comparative statement for the month ended March 15, 1915 and the three months ended March 15, 1915, follows:

	For Month Ended		For Three Months Ended	
	March 31, 1915	Year Previous	March 31, 1915	Year Previous
Gross earnings	$112,458	$108,386	$331,063	$323,644
Operating expenses and taxes	57,187	54,411	166,393	160,532
Net earnings	55,271	53,975	164,670	163,112
Less interest charges	26,389	25,128	79,112	78,348
Net surplus	$ 28,882	$ 28,847	$ 85,558	$ 84,764

Telephone Operators Meet at Owosso, Mich.

Thirty-five telephone operators, representing Owosso, Grand Rapids, Elsie, Ionia, Flint, Durand, St. Johns, Fenton, Laingsburg, Ovid, Saginaw and Lansing recently attended a school of instruction in the Union Telephone Co.'s building at Owosso. F. V. Newman, secretary of the Michigan Independent Telephone & Traffic Association, of Grand Rapids, had charge of the meeting. He was assisted by Miss Bertha Stickney, of Grand Rapids, traveling instructor for the association.

Three exchange boards were installed and the operators were drilled in the theory and correct practice of long distance operating.

The Owosso operators hold monthly meetings at which time the local and long distance work is discussed. These meetings are in charge of the local exchange manager and the chief operator.

Operators' School of Instruction at Carlinville, Ill.

The Independent telephone companies of Illinois will hold a school of instruction for telephone men and operators at Carlinville, Ill., on May 4 and 5. Arrangements for the school were made by E. S. Sterritt, of Henry, president of the Macoupin County Telephone Co., of Carlinville, and C. B. Cheadle, of Joliet, secretary of the Carlinville company. The school will be in charge of W. S. Vivian, of Chicago, secretary of the Independent Telephone Association of America.

Telephones Replacing Telegraph for Train Dispatching.

Telephones have displaced telegraph instruments for the dispatching of trains on 60,000 out of the 250,000 miles of railroad in the United States, according to an official of the American Telephone & Telegraph Co.

"Telephony's" Home Study Course for Telephone Men

A Complete Presentation of the Principles Underlying Modern Telephony in All Its Branches—Arranged Systematically So That Regular Reading and Faithful Study Will Qualify Ambitious Men for Higher Positions—Prepared Under Supervision of Stanley R. Edwards—This Section Written by Jay G. Mitchell

Quiz Questions on the Preceding Installment.

The answer to these questions will be found in the reading section bearing the same number. Answers are not to be sent to TELEPHONY for criticism. For the benefit of those desiring the advantages of a correspondence course, the Engineering Extension Department of the Iowa State College has volunteered to answer questions and criticize replies to questions and solutions of the problems which will be presented from time to time in connection with the course. No charge will be made for this service and the offer applies to all subscribers of TELEPHONY regardless of whether they live in Iowa or elsewhere. Correspondence should be addressed to the Engineering Extension Department, Iowa State College, Ames, Iowa.

91. What was the origin of the microphone?

92. State the underlying principles of the present standard type of transmitter.

93. Why must the electrodes of a transmitter cell be highly polished?

94. What is the law covering resistance of a conductor as related to its length and sectional area?

95. Explain how current (amperes) depends on resistance.

96. Explain the relation between current (amperes) and E. M. F. (volts).

97. Write out Ohm's Law.

CHAPTER VI. The Magneto Set (Cont'd).

98. *Action of the transmitter.* We have seen how a variable current flowing in the primary winding of an induction coil will produce an alternating current in its secondary coil. Suppose we should consider the resistance of the transmitter, when it is at rest, as 40 ohms. With a voltage of 3 volts and a resistance in the primary winding of the induction coil and the other wire of the circuit of 2 ohms, the current would be 3 volts divided by a total of 42 ohms, or 1/14 ampere (.07). Now suppose that the transmitter diaphragm is forced in by the condensed zone of a sound wave. We have seen that this will crowd, press, and flatten the carbon granules more or less. This will reduce the resistance of the transmitter, for example, say to 30 ohms. We should now have a current of 3 volts divided by a total of 32 ohms or 3/32 ampere (.09).

As the rarefied layer of air due to the sound wave strikes it, the diaphragm moves outward, releasing the pressure on the granules and loosening them. This will, of course, increase the resistance of the transmitter to say 60 ohms. We should now have a current of 3 volts divided by a total of 62 ohms or 3/62 ampere (.05). In other words, the current in the primary of the induction coil under the conditions assumed is normally .07 ampere. It varies under the influence of sound waves from a maximum of .09 ampere to a minimum of .05 ampere. This is a variation of 2/7 or nearly 30 per cent. in each direction. It should be remembered that the magnetic flux through the core of the induction coil will also vary if this variable current flows in the primary. This will cause an alternating current in the secondary.

Suppose that we are working with the commercial induction coil mentioned in Section 79, TELEPHONY April 3, where the number of turns in the secondary is about six times as great as the number of turns in the primary. We have seen how the current induced in a coil by a magnetic field threading the winding, is due to the number of lines of force in the magnetic circuit. In the induction coil each turn of the secondary will be threaded by the lines of force and contribute to the current in the whole secondary winding. But there are six times as many turns in the secondary as there are in the primary. Therefore, if the resistance of the secondary circuit is neglected for the present, since six times as many turns are threaded by the lines of force, we shall find six times the voltage in the secondary winding that is present in the primary. This increased voltage of the secondary winding affords an opportunity to send the voice currents through a much longer circuit than would be the case if the lower battery voltage was relied upon. There are other reasons for the induction coil to be brought out later.

In general, in any induced current, the voltage is proportional to the total lines of force cut by each turn multiplied by the number of turns. In induction coils, transformers, and repeating coils, the ratio of transformation is the number of turns in the primary divided by the number of turns in the secondary. The voltage of the primary winding is approximately multiplied by this factor to get the secondary voltage. Sometimes the number of turns in the secondary is less than the number in the primary. In such cases, the ratio of transformation is less than one and the secondary voltage is lower than the primary. This is the case in service transformers used in electric light plants.

99. *The bipolar receiver.* The theory of the standard type of bipolar receiver is shown in Fig. 34. Soft iron extensions, *B*, are fastened to the poles of a permanent magnet, *A*, of the horseshoe type. On these extensions are wound coils *C*. These coils are connected in series so that they are in accord in affecting the magnetic flux through the magnetic circuit of the instrument. In close proximity to the soft iron extensions of the pole pieces, is placed the diaphragm *D*. This must be of iron and is usually covered with enamel as a protection

against rust. As we have seen, the magnetic lines of force, represented in the illustration by the dotted lines, pass through the permanent magnet and its polar extensions *B*, after which they are carried through the air gaps and the diaphragm *D*. Being in a magnetic field, the diaphragm *D* places itself in

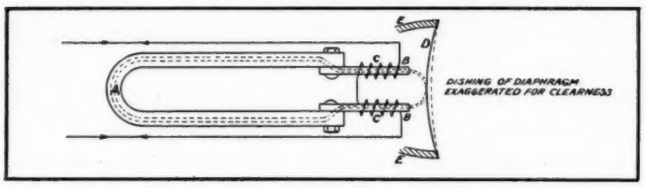


Fig. 34. Theory of Magneto Receiver.

such a position as to include in its own mass the greatest possible number of these lines. Since it is supported at the edges by the cup *E*, this causes it to become slightly dished. In this respect, it is in the same condition as the diaphragms of the "acoustic" telephones described in Section 89 (TELEPHONY, April 10).

100. *The direct current receiver.* It is true that a receiver might be constructed without a permanent magnet, *A*, and some common battery instruments are so made. It is important to note that these receivers are always supplied with *direct* magnetizing current when in use. They, therefore, are subject to the same analysis as the permanent magnet receiver, although their basic magnetic field is due to the electromagnetic action of the coils carrying direct current instead of a permanent magnet as shown in Fig. 34.

Suppose, for the moment, that the receiver in question has no magnetic flux in its magnetic circuit when the alternating voice currents from the distant station begin to flow through its coils. This, of course, is not the case with the highly efficient so-called direct current receiver used in common battery work. Their magnetic fields are created by the magnetizing current always supplied to them over the line circuit. The alternating current will build up a field first in one direction and then in the other. The diaphragm will, of course, respond to this varying field and will reproduce the sound waves after a fashion. The diaphragm will be drawn toward the pole pieces and released again for each flow of current, *regardless* of its direction. In other words, the diaphragm will approach the poles when the current is in one direction. It will be released as the current decreases and will again be drawn toward the poles as the current increases in the reverse direction. It must pass through the period of rest and be attracted anew for each fluctuation of the current.

There is a definite time required to build up any magnetic field in iron. We should, therefore, expect to find that some of the more delicate alternations of current fail to have the proper influence over the diaphragm. The more rapid changes of the voice currents are produced in the circuit by the induction coil at the distant station acting under the influence of the transmitter diaphragm. It is the more delicate electrical waves found in the telephonic voice currents which confer on sounds reproduced by the receiver, their individual quality. By means of the sound waves corresponding to these finer and more rapid electrical waves, we recognize the voices of our acquaintances. These waves also constitute the difference in sound between a piano string and a violin string tuned to the same pitch. Their joint effect is called the quality or timbre of sounds.

There is still another defect in a receiver designed to operate without any permanent or basic magnetic field. It must always be remembered that the direct current receiver of common battery systems has a basic magnetic field when in use. As the flux in the magnetic circuit would be built up by the voice currents flowing through the windings, the diaphragm, as we have seen, would always be momentarily attracted toward the poles regardless of the direction of the current flow. When the transmitter diaphragm at the distant station was vibrating in one direction, the receiver diaphragm would approach the magnet poles. When the transmitter diaphragm, on the other hand, reversed its direction of travel, the receiver diaphragm would *again* be drawn toward the magnet poles. Its motion would not correspond to the motion of the distant diaphragm as to direction. It is clear that the most truthful reproduction of sound would require that it *should* do so. The reader should verify the last statement in order to test his understanding of the operation of the various elements of the telephonic circuit from one station to another.

101. *Properties of the standard type of receiver.* In the case of the standard receiver having a continuous or basic magnetic flux, the effect of the alternating current is to strengthen the flux when it flows in one direction. This causes the diaphragm to be drawn closer to the pole pieces. When the voice current flows in the opposite direction, the magnetic flux is weakened; the tension on the receiver diaphragm is reduced and it moves farther away from the magnet poles than is normal. All the more delicate electrical voice currents have their full effect, within practical limits, on the motion of the receiver diaphragm. Sounds within the range of the distant transmitter are reproduced with the greatest exactitude. It may be said, as an illustration, that the permanent magnetic field of the standard receiver keeps it in a state of constant attention. Without this permanent field, the attention would not be perfect.

102. *Connections of coils of electromagnets.* Let us consider for a moment the winding of a solenoid. We have found that when the current in the winding flows in the same direc-

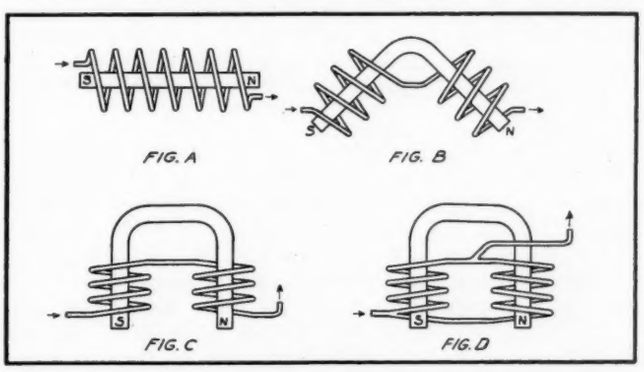


Fig. 35. Principles of Coil Connections for Horseshoe Magnets.

tion as the hands of a clock with the observer facing the end, the pole at which the observer is looking is a south magnetic pole. It is also true, of course, that if the current flows counter-clockwise, the pole facing the observer is a north magnetic pole. Now suppose that an iron core is inserted in the solenoid. We know that the iron core is

strongly magnetized whenever a current circulates around it in the windings. The magnetic poles of the iron core would, of course, be located the same as the magnetic poles of the solenoid. The iron core and solenoid, Fig. 35-*A*, would constitute an electromagnet of the bar type. Now suppose the

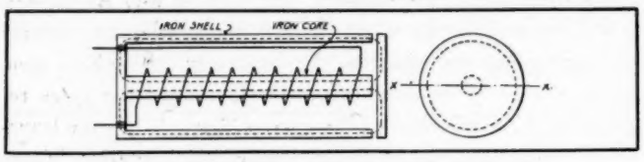


Fig. 36. Enclosed Type of Electromagnet.

iron core bent into a horseshoe form as shown in Fig. 35-*B*. The turns of wire near the center would spread as the magnet is bent. The reader should note carefully the direction of the connecting wire between the two main coils as the final horseshoe form, Fig. 35-*C*, is reached. While it may seem at first to be improperly connected, a little consideration will show that if the core should be straightened, the turns would all resume their previous arrangement. The final form, Fig. 35-*C*, is the arrangement used in practically all electromagnets.

In a few instances, the arrangement shown in Fig. 35-*D* is used. This is only to be employed when other considerations render it necessary to have the resistance of the entire magnet winding as low as possible. Extreme care must always be taken to connect the coils of a horseshoe electromagnet so that each one confirms the magnetic polarity created in the coil by the other. If this is not true, the one coil will neutralize the flux created by the other and the result will not be a magnetic field in the magnetic circuit.

There is still another type of electromagnet used in telephone equipment. It is the enclosed type, almost universally employed for heavy duty, lifting magnets. The theory of this type is shown in Fig. 36 and will be at once recognized as the standard form of iron clad drop. On the left is shown a sectional view on the line *X X* of the end view on the left. The path of the magnetic lines of force through the air gap and armature is shown by dotted lines. It should be remembered, however, that the magnetic lines of force traverse the air gap to the outer shell in all directions after leaving the core, spreading out in a way very similar to branches of a tree. This is an efficient form of electromagnet as the *area* of the air gap is large compared with other forms, while its length is no greater. It is the same form of electromagnet used in the electric brakes for large electric railway equipment. In both the lifting magnet and the electric brake, the diameter of the shell is many times as great as its length.

(*To be continued*)

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities and Actions of City Councils Bearing Upon Franchises, Rates and Service

Decision in New Hartford and Whitesboro Rate Case.

The New York Public Service Commission has rendered its decision in the New Hartford and Whitesboro telephone rate cases. According to the order the New York Telephone Co. is required to extend its Utica rates so as to apply to the New Hartford and Whitesboro exchange areas, thus eliminating the toll charge of 5 cents for number calls and 10 cents for particular person calls which the respondent established shortly after taking over the Utica Home Telephone Co.'s property, and which is the basis of the six complaints in the cases which are decided. Extension of the Utica rates to New Hartford and Whitesboro is accompanied by an amendment which provides a four-party business rate in New Hartford and Whitesboro.

The Utica Home Telephone Co. before its consolidation with the Bell company, had in effect certain rates for New Hartford and Whitesboro which gave subscribers the right to talk with Utica, and certain rates for Utica which gave subscribers the right to talk with New Hartford and Whitesboro, and subscribers in New Hartford and Whitesboro were entitled to talk with each other. The Utica Home Telephone Co.'s property was taken over through purchase by the New York Telephone Co. By the consolidation the Utica rates for former Home company's subscribers were raised. After the consolidation the New Hartford and Whitesboro rates were slightly changed. A year afterward the right to talk under local contract rates between Utica and New Hartford or Whitesboro was taken away and a toll charge instituted which constituted another increase in rates and diminished the value of the service rendered to subscribers in New Hartford and Whitesboro and also to subscribers in Utica. This toll charge also carried a material increase in rates to people residing in New Hartford and Whitesboro who had large use for Utica service and to get it most economically were obliged to take Utica rates plus mileage charges and be confined to Utica service except on paying a toll to talk with their neighbors in New Hartford or Whitesboro. Under these restricted service conditions the number of subscribers in New Hartford and Whitesboro diminished considerably.

Prior to the consolidation, the Utica Home company had in New Hartford 250 telephones and in Whitesboro 266 telephones. On September 1, 1914, the New Hartford telephones had diminished to 137 and the Whitesboro telephones to 245. The commission finds that the real diminution in service and value of service was caused by putting in a toll charge to and from Utica.

The commission says that telephone rates in this flat rate territory should be so arranged as to induce the freest possible use of its service; and that the telephone facility has become for most people a business and household instrumentality of importance, and with many a practical necessity. In New Hartford and Whitesboro there are business houses and manufacturing establishments, some of which are large, and most of which have occasion to telephone daily and often frequently during the day to Utica and to receive communications from Utica. Many of the residences in this outlying territory are those of Utica business men. The business, social and family requirements are such that as a whole the territory should be in practice added to the Utica service.

The commission says that in this case it thinks there is sufficient option in the varying Utica rates themselves, with an amendment of the business rate to provide a four-party rate in New Hartford and Whitesboro for small business users. The present rates in New Hartford and Whitesboro with the service restricted to local communication and not even extend-

ing from one of those areas to the other are practically paper rates, the commission finds, so far as attracting or holding subscribers to the use of respondent's line. It is also stated that there is a practical unanimity of discontent with those conditions so far as can be ascertained, and that the rate conditions established by respondent after the consolidation, with the introduction of the toll charge, operated decisively to discourage increase and even retention of its business in New Hartford and Whitesboro. The commission also says that if authority to suspend advanced telephone rates pending investigation had been conferred upon the commission before these complaints were filed, the proceeding would have been simplified. The subscribers so greatly dissatisfied with the introduction of the Utica toll rate would then have retained their telephones pending investigation and order, and the whole matter would have been disposed of to the better satisfaction of all parties. The legislature has been asked to amend the law in this respect.

Bell Refuses to Connect with Independent Apparatus.

Some trouble has arisen in Prince Edward Island over telephone matters, in which Independents all over the country are deeply interested. The Prince Edward Island Telephone Co. bought instruments from the Canadian Independent Telephone Co., and has been cut off the Bell line. the claim being put forward that its contract calls for standard equipment. The Northern Electric Telephone Co. instrument, it is said, must be used, its price there being $15.50 without any battery. The same identical telephone is sold to farmers and all other telephone users in Ontario for $12.74. The Bell company in Ontario and Quebec is just as scrupulous about equipment connecting with its switchboards as any company could be, yet thousands of Independent companies' telephones are connected with its switchboards in these provinces.

The Independents object particularly to the company's charging nearly $3 more in Prince Edward Island than elsewhere for the same instrument. The Maritime Telegraph & Telephone Co., in Nova Scotia, made a similar attempt last year, though not going so far as to cut off Independent telephones. It did not succeed, and now it allows local lines with Independent and other standard makes of instruments to connect with its switchboards.

The Prince Edward Island Telephone Co. having a provincial charter, the Dominion Railway Board of Commissioners has no jurisdiction over it. F. D. Mackay, manager of the Canadian Independent Telephone Co., has taken up the matter in correspondence with the provincial secretary.

Mercantile Committee Favors Massachusetts Investigation.

Governor Walsh's recommendation for an investigation of telephone rates and service in Massachusettes has been given favorable action by the Mercantile Committee before which it was given a hearing. The committee voted to report a bill calling for such an investigation. It is provided that it shall be made by the public service commission, which shall report its finding to the next general court.

The committee will report no legislation necessary on the Governor's recommendation to transfer the supervision of the telephone companies from the public service commission to the gas and electric light commission.

Pacific Company Not Permitted to Reduce Initial Period.

The Idaho Public Utilities Commission has denied the application of the Pacific Telephone & Telegraph Co. to reduce from three to one minute the initial period on which long distance telephone rates are based.

The commission found that in Lewiston the average length of long distance conversations carried on in a period of 30 days was 2.17 minutes, and the average for Moscow 2.08 minutes.

The greater bulk of the telephone business in Idaho, the commission states, is carried on under the three-minute initial period, and is not believed that the population of the territory affected by this application is so dense or that the demands upon the lines of applicant company are so great that the commission would be justified in authorizing the publication of the proposed schedule which seeks to place the entire territory under the one-minute period.

Cost of Extension Telephones to be Investigated.

Governor Walsh of Massachusetts has signed a resolution requiring the public service commission to investigate the cost of extension telephone service within the state. The resolution is based on the bill filed last year by Senator Garst which provided that a telephone company may make a charge for an extension telephone or telephones, not exceeding the installation cost plus an additional charge of not over 25 per cent. of the cost of the telephone or telephones, including the cost of installation; this additional charge being designed to cover depreciation and maintenance, the subscriber paying for the cost of avoidable injuries and for removals.

Lebanon (Ind.) Telephone Co. Wins Suit.

In the case of the state of Indiana vs. the Lebanon Telephone Co., of Lebanon, Ind., Judge Jere West, of Crawfordsville, Ind., decided in favor of the latter in a suit to forfeit the telephone company's charter. The suit was brought by the state on the technical ground that the company had failed to renew a bond for $5,000 as required by law, and that all its operations during the period the bond should have been effective, were illegal. The company's defense was that the charter must remain effective and could not be denied, because the patrons and the city of Lebanon had accepted the benefits.

Judge West, in his decision, held that the reply of the state to the defendant's answer did not state facts sufficient to avoid the answer, that the contract upon which the state sued was not such a contract as could be sued upon in a quo warranto proceeding, and that the subject matter of the action was such as to bring it within the jurisdiction of the public service commission.

Rate Schedule for Crawfordsville, Ind., Agreed Upon.

At a conference of the Commercial Club of Crawfordsville, Ind., and officials of the Central Union Telephone Co., a rate of $3 a month for business telephones and $1.25 for residence service, was agreed upon.

Subscriber Wins Suit Against Telephone Company.

A jury in the supreme court at Binghamton, N. Y., recently awarded L. M. Peters the sum of $100 in his suit against the Chenango Valley Telephone Co. because central refused to answer his ring or to connect him with the number requested.

Physical Connection Bill Passes Iowa Senate.

The Senate of the Iowa legislature has passed the Crist bill requiring competing telephone companies to make physical connection. The bill also provides that control over telephone companies be placed in the hands of the state railway commission.

Summary of State Commission Hearings and Rulings.

CALIFORNIA.

March 13: Order authorizing the Pacific Telephone & Telegraph Co. to purchase certain telephone property of the Weed Lumber Co., at Weed, Cal.

March 19: C. M. Kirkby authorized to sell his telephone system operating in the town of Dixon, Cal., and known as the Dixon Mutual Telephone Co., to the Pacific Telephone & Telegraph Co. for the sum of $500.

March 22: Southwestern Home Telephone Co., of Redlands, Cal., authorized to renew two promissory notes of the aggregate face value of $11,000 for a period not to exceed two years, such notes to bear interest at not to exceed 8 per cent. and to be secured by $22,000 face value of the applicant's bonds.

March 22: The commission dismissed the application of the Union Home Telephone & Telegraph Co., of Los Angeles, Cal., for an order authorizing it to sell its treasury bonds or to use its treasury bonds as collateral to borrow money to carry out certain construction work as provided in the ordinances of the cities of San Bernardino and Long Beach, and for an order authorizing an increase in rates, the company having requested on March 16 that the application be dismissed.

April: G. Warren authorized to transfer the Cambria Telephone Co., of San Luis Obispo county, Cal., to A. F. Paterson. A. F. Patterson is, in turn, authorized to sell the system to Mrs. J. Guerra.

FLORIDA.

April 7: The commission denied the application of the Sanford (Fla.) Telephone Co. for permission to sell its plant to the Southern Bell Telephone & Telegraph Co. and to permit an advance of 50 cents a month for business telephones when the Southern Bell had made such improvements to the plant as agreed upon as a condition of the sale.

IDAHO.

April 9: Application of the Pacific Telephone & Telegraph Co. to reduce the initial period for long distance calls in Idaho from three to one minute, has been denied.

ILLINOIS.

April 20: Hearing on complaint of the Daniels Telephone Co. of Iuka, Ill., that the People's Telephone Co., of southern Illinois, is constructing and operating a telephone exchange in the village of Xenia without a certificate of convenience and necessity.

April 20: Hearing on complaint of the Farmers' Mutual Telephone Co., of Lostant, Ill., against the Central Union Telephone Co. and the Tonica (Ill.) Telephone Co. as to refusal of defendant companies to receive and transmit messages from complainant company; also complaint of discrimination by defendant companies in favor of other companies and against complainant company at Lostant.

April 20: Hearing on application of the Colchester Farmers' Telephone Co. for authority to change telephone rates at Colchester.

April 20: Hearing on application of the Johnson County Mutual Telephone Co., of Belknap, Ill., for a certificate of convenience and necessity to install a telephone exchange at Crossroads, eight miles southeast of Vienna.

April 22: Hearing on amended application of the Moweaqua Telephone Co. for authority to increase rates in the village of Moweaqua and vicinity.

INDIANA.

April 9: Hearing in the petition of the Versailles (Ind.) Telephone Co. for permission to increase its rates and to make connection at Benham with the Farmers Mutual Telephone Co.

April 21: Hearing in regard to the controversy between the South Bend (Ind.) Home Telephone Co. and the Rochester (Ind.) Telephone Co. over the ownership of a toll line through Fulton county. The Rochester company is alleged by the South Bend company to have cut the line on March 25 following arguments as to ownership of the line.

April 22: Postponed hearing on the application of the Citizens Telephone Co., of Columbus, Ind., for permission to increase its rural rates.

KANSAS..

May 5: Hearing on application of the Baxter Telephone Co., of Baxter Springs, Kans., for permission to increase rates.

MISSOURI.

April 20: Hearing on application of the Farmers Telephone Co., of Harrison County to increase rates at Bethany, Melbourne, Coffey, Edinburgh, Bridgeport, Thomas, Gilman City, Ridgeway and Brimson. Case 559.

April 20: Hearing on petition of the Grand River Telephone Co. to purchase from the Farmers Telephone Co., of Harrison county the exchange at Mt. Moriah and to consolidate the same with the exchange now owned by the Grand River company. Case 666.

April 28: Hearing on the application of the Cape Girardeau (Mo.) Bell Telephone Co. to abolish a combination reduced rate.

April 17: Application filed by James T. Harmon for a certificate of convenience and necessity to construct and operate a telephone exchange at Licking, Mo. Case 664.

NEBRASKA.

April: Monroe (Neb.) Independent Telephone Co. authorized to issue $15,000 worth of capital stock. Of the amount to be issued, $8,500 is for the purchase or construction of an exchange building at Newman Grove; $2,500 for similar purpose at Albion; $1,500 for a building at Monroe; and $2,500 to take up existing indebtedness.

April 13: Petition signed by several hundred business men of Columbus, Neb., has been filed with the commission requesting that the Nebraska Telephone Co. and the Platte County Independent Telephone Co. be compelled to furnish physical connection for long distance calls.

NEW YORK.

April 19: Hearing in regard to complaint of the citizens of Watervliet, N. Y., against the New York Telephone Co. The complaint alleges that the rates charged are in excess of the average rates charged in cities of the same size in other parts of the state.

May 5: Postponed hearing regarding the rates of the New York Telephone Co. in Albany, Cohoes, Waterford and vicinity.

OHIO.

April 20: Jefferson & Warren Telephone Co., of Orangeville, Ohio, authorized to sell to the Windsor Telephone Co., of Windsor, Ohio, the lines of poles and wires extending over a distance of approximately 11 miles within the townships of Hartsgrove and Windsor, for the sum of $325.

April 20: Hearing in regard to the protest of the Lima, Ohio, city council against the rates, service and legality of the Lima Telephone & Telegraph Co.'s action in raising its charges above those specified in the franchise ordinance of 1895.

OKLAHOMA.

April: Petition filed by the Union City Telephone Co., of Union City, Okla., asking for an investigation of the toll rates of the Pioneer Telephone & Telegraph Co. The complainant alleges that residents of Union City are required to pay toll charges on calls to El Reno, a neighboring city, while rural subscribers are given that service without additional cost.

April: Hearing in the case of the Watova (Okla.) Telephone Co. vs. the Pioneer Telephone & Telegraph Co., in regard to physical connection.

April: At a hearing in regard to the failure of the Crescent (Okla.) Telephone Co. to file certain reports with the commission, the Crescent company was ordered fined $200.

April: Hearing in regard to the petition of John F. Dryden, of Yale, Okla., for an order requiring the Pioneer Telephone & Telegraph Co. to make physical connection with the complainant's lines and furnish him long distance service.

May 3: Postponed hearing in regard to complaints of Independent telephone companies of Oklahoma, charging that the Pioneer Telephone & Telegraph Co. is making threats or actually removing its toll line connections as a means of forcing the complainants to sign contracts for a division of long distance receipts more generous to the Pioneer than the Independents agree to concede.

OREGON.

April 7: Hearing in regard to complaint of L. Q. Swetland, manager of the Perkins Hotel against the Pacific Telephone & Telegraph Co., the complainant alleging that he had been refused dual service by the defendant, which he sought under the ruling of the commission that telephones of the Home Telephone & Telegraph Co. could be connected to lines of the Pacific company. A week was granted to the attorney for the Home company in which to reopen the case before the commission and present additional evidence in rebuttal to that adduced by the Pacific company.

PENNSYLVANIA.

April 27: Hearing at Harrisburg, Pa., in regard to the proposed schedule of uniform telephone rates throughout the state, a subject which has been under investigation for nearly two years.

WASHINGTON.

May 15: Hearing on the valuation of the properties of the Pacific Telephone & Telegraph Co. in the state of Washington. On the valuation to be fixed, as a result of this hearing, telephone rates, both for exchange and toll service, will be based.

WISCONSIN.

April: La Crosse (Wis.) Telephone Co. authorized to issue $15,000 in stock for the purpose of making extensions and additions to its system.

April: Application filed by the Rudolph (Wis.) Telephone Co. for permission to issue stock to the amount of $12,500 for the purpose of making extensions to its lines.

April 22: Hearing in regard to application of the Jackson (Wis.) Telephone Co. for authority to increase rates. U.—780.

April 23: Hearing in regard to application of the Friendship (Wis.) Telephone Co. for permission to increase rates.

May 13: Hearing at Madison, Wis., on the petition for a revision of Milwaukee telephone rates. The petition was filed in April, 1910, by Peter Bogart and other citizens, and the city joined in the petition a year later. The railroad commission has recently completed a physical valuation of the Wisconsin Telephone Co.'s physical property for a basis upon which to determine rates.

Practical Subjects—Letters and Discussions

Manitoba Government Telephones Have No Deficit.

I wish to call attention to an error in TELEPHONY of April 17, page 36. The concluding sentence of the article ending at the top of the right column says: "In this manner Alberta is doing better than Manitoba and Saskatchewan, which have acknowledged a deficit, with a smaller capitalization per telephone."

The statement that the Manitoba Government Telephones has a deficit is untrue, and misleading to the public. Our last three annual reports show a surplus, and if the figures were added together for the seven years of operation it would result in a surplus.

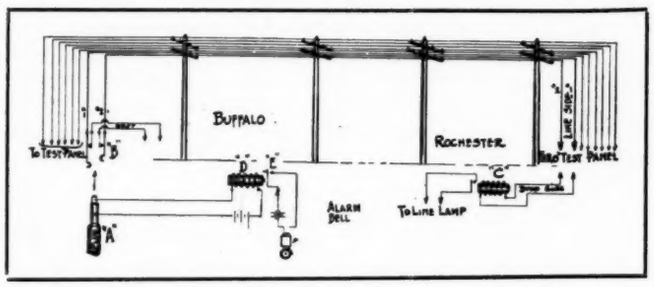
It is the intention and purpose of this successful government-owned organization to furnish an economical and efficient telephone service to the public at as near cost as operation will permit. It is not the intention to operate at a profit. This organization carries an ample depreciation account, in addition to adequate financial arrangements for its bonded indebtedness.

H. E. Brockwell, Acting Commissioner,
Manitoba Government Telephones.

Winnipeg, Man., Canada.

A Trap for Line Wire Thieves.

The night wire chief in the telephone building was not perturbed when a voice from police headquarters informed him that there was reason to expect a raid by wire thieves. Men



Circuit Arrangement Used to Detect Wire Thieves.

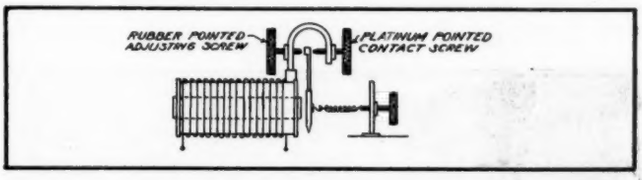
of suspicious appearance had been seen loitering near the company's poles a short distance outside the city, on a main road leading east.

The police had previously apprehended men with telephone wire in their possession, but had not caught any engaged in tearing down or cutting wires, and the company was eager to get someone "with the goods." The wire chief, therefore, on receipt of the news of probable activity on the part of the wire thieves, requested the police at the station nearest the expected point of attack to be ready for a call. He also asked the sheriff to send half a dozen deputies to the same station to act with the police when the time came.

This done, he set himself to forming a trap for the thieves. He knew that their practice is to fasten a brick or other weight, or a hook, to a stout line, and to throw the missile from a position in the roadway over or among the wires. Then they would pull down all the wires caught by the hook or inclosed in the rope. Thus the one wire sure to be pulled down, if any, is the outside wire on the lower arm.

With this knowledge, he proceeded to devise an alarm to indicate the beginning of operations by the gang. He might have had operators ring on these lines every few minutes, or have had them "sleep" on the wires, listening for tell-tale sounds, but he had a better and more workmanlike method. He brought into use an existing Morse set relay on the toll test panel. The adjusting screws on the screw retainer were transposed. The screw pointed with platinum was placed at the back of the armature and the screw pointed with hard rubber at the front. Then he cut in a bell and battery between the armature and the contact screw.

Next, being careful to select the line which took the outside pin on the lower arm, he sent battery out over the toll line



Details of Relay.

through the winding of the drop at the distant office. The circuit being closed through the winding of the Morse relay, the soft iron core running through the coil of the relay became an electromagnet and attracted the armature to the dead contact, keeping open the alarm circuit as long as the toll line circuit was closed.

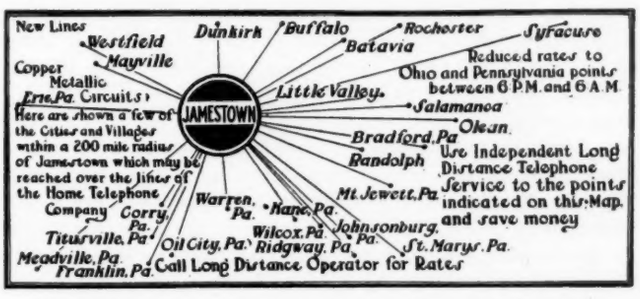
A break in the toll line circuit would stop the battery flow through the winding of the relay; cessation of the battery flow would cause the soft iron core to lose its magnetic power, and the tension spring would pull the armature back upon the platinum-pointed contact screw, closing the alarm bell circuit.

The wire thieves, ignorant of these preparations to signal the beginning of their activities, set the alarm ringing shortly after midnight, and the wire chief promptly notified the police. The officers hurried quietly to the scene and took the thieves by surprise. They had worked rapidly, and already had four sections of copper wire coiled in their wagon, but they were only three in number and were taken without a struggle.

In the illustration, insertion of plug *A* in the line test jack *B* sends battery out on toll line wire No. 1, through winding of drop *C* at distant office, returning on line wire No. 2, thus closing the circuit through winding of relay *D*. When the line wires are cut, the circuit is opened, allowing the armature of relay *D* to fall back on contact *E*, closing the circuit through the alarm bell.

Advertising Long Distance Service.

An effective scheme for advertising its toll and long distance service has been adopted by the Home Telephone Co., of Jamestown, N. Y. The company is sending to its patrons a blotter on which is presented a diagram showing the points



Blotter, Showing Long Distance Connections with Jamestown.

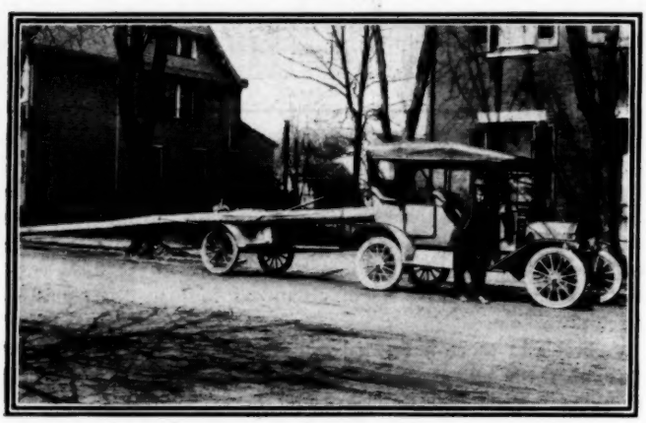
within a 200-mile radius which may be reached by long distance over its lines. They are Mayville, Westfield, Dunkirk, Buffalo, Batavia, Rochester, Little Valley, Syracuse, Salamanca, Olean and Randolph, N. Y.; Bradford, Mt. Jewett, Johnsonburg, St. Marys, Kane, Wilcox, Ridgway, Warren, Oil City, Corry, Titusville, Meadville, Franklin and Erie, Pa. This

blotter, which is reproduced in the accompanying illustration, is shown in two colors in the original. The names of the towns are presented in black ink, and the remainder of the lettering, including the circle in the center, across which "Jamestown" is written, is printed in red.

A Homemade Trailer for Hauling Poles.

I am enclosing a picture which I thought might be interesting for you to put in your paper, as I am acquainted with many of the telephone boys in the Middle West.

This trailer I consider one of the most useful things I have around the plant for use in construction work or repairing



Automobile with Homemade Trailer Attached.

lines. I made it from parts picked up around town. I got a heavy spring wagon axle out of the junk pile and had the spindles turned down at the machine shop to fit the Ford hub and picked up an old set of automobile springs and fenders and use my old tires off my automobile for it.

I have a coupling on my machine all the time and it is only a second's work to hook it on at any time. It runs along as quiet and rides as easy as the machine itself.

H. R. Means, Manager.
Harrison, Ohio. Harrison Telephone Co.

Some Suggestions for Going After P. B. X. Prospects.

The telephone-using public look to us for advice regarding the most suitable service for their needs, says E. M. Taylor, district manager of the Chesapeake & Potomac Telephone Co., at Lynchburg, Va., in a recent issue of the Transmitter, of Baltimore. The salesman should study each case to be certain that he is selling the service best suited for the applicant's business.

We should keep before us at all times a working list of prospects taken from the busy reports forwarded from the traffic department. Each prospect should receive a letter giving him a report of the "busies" credited to his station, quoting prices for a private branch exchange of the proper kind, listing the stations and prices of his present service for comparative purposes, and enumerating the private branch exchanges connected with the system—especially those in the same line of business with the prospect. This letter should also cite the convenience the system will be to the buying public, what an advertisement it will be to the man's business—combining as it does a local, long distance, and intercommunicating system—and it should advise him that within a few days your salesman will call upon him with further and equally interesting particulars.

A private branch is rarely "signed" on the first visit. All members of the firm must be interested. Almost the first negative you hear is: "The price is too high," or "You did not mention the salary of an operator," or "My present service fills the bill." Even so, you have succeeded well enough so far; you have gained an audience with the concern—and that is a good starter.

It is your turn now. "Yes, it is costlier than your present plant; the operating is an expense, but I can't agree with you that your present equipment fills your needs. My letter told you how many times your telephone doors were closed to patrons. Your intercommunicating plant is not a helpful adjunct to your present service. At best it is only a convenience for your employes.

"Certainly you are interested in a plant that affords convenience to the buying public. The private branch exchange will give you an almost perfect control over your telephone business. As it is now, you do not know how your business is being handled.

"Yes, the difference in your present rate and the cost of a private branch exchange, probably including an operator, would be sufficient to add several other direct lines—that's true. Let us study the line question. If you needed more lines for your private branch system, more could be added to meet the demands of your business; but more lines added to those you now have not only increases your expense but cuts down the efficiency.

"How often, for instance, have you answered the telephone and requested the calling person to call another of your numbers? Think of the loss of time in your establishment and the annoyance to customers. How often have you heard a clerk called to the telephone, perhaps making it necessary for two clerks to leave customers?"

Some of our customers group their telephones to seeming advantage. This method causes a crowded condition, a confusion in the answering of telephones, and withdraws attention from customers distributed over the store. The private branch exchange, on the other hand, admits of elasticity in the promoting of business. Often an operator can be of great service in answering calls, taking orders, placing and handling long distance calls and so on. When not busy making actual connections, she can place calls and become telephonically acquainted with the purchasing public.

Prospects for P. B. X. service should be followed up regularly. If we take note of various concerns adding stations, especially extensions, and if we will scan the list of these large users, we will find unexpected private branch exchange prospects.

Railroad companies invariably use private branch exchange at their home offices, and almost as invariably fail to employ them in their offices along the lines. As a rule, they are of great importance in their smaller offices, and it only remains for us to prove this.

One prospect that I recall wanted an extension with a simple knife switch. He was shown the disadvantage of the switch and the advantage of the switchboard. Another wanted several extensions. The disadvantage of loaded lines and the distribution of service by means of a P. B. X. were explained. One prospect asked the name of a good intercommunicating plant. Another told a salesman the placing of long distance calls was taking up a great deal of his time. Still another, while conversing with one of our managers about the usage of a private branch exchange, was interviewed regarding busy lines—which in one case had meant a lost sale. "A most opportune complaint," said the prospect. It closed the sale.

Private branch exchange development is probably the most interesting work in connection with commercial field duties. I have known of only one such exchange being discontinued, and that concern did not need it. We receive fewer complaints from our P. B. X. subscribers. Nothing encourages a salesman more than the getting of a private branch exchange application. His success with his first one warrants his continued enthusiasm.

From Factory and Salesroom

Convention: Tri-State Independent Telephone Association, Memphis, Tenn., May 21, 22

Stromberg-Carlson Display at the Harrisburg Convention.

The Stromberg-Carlson Telephone Mfg. Co., of Rochester, N. Y., had a very interesting and attractive exhibit at the joint convention of the Eastern and Western Independent telephone associations which was held recently at Harrisburg, Pa.

Its exhibit of "Quality Apparatus" included several panels of standard telephones, multiple and non-multiple apparatus trays mounted on a neat display table of suitable design. On two of the panels the central energy telephones of various types were displayed, each instrument being arranged so that it could be easily examined. On the third panel the No. 896 compact wall instrument was mounted with the individual parts, thus enabling the visitors to examine every detail of the construction.

Parts that enter into the construction of multiple, private branch exchange and magneto switchboards were kept in felt-lined trays with recessed spaces shaped to accommodate each part. These parts merely resting in their respective places, could be easily removed for inspection.

D. W. Brown, who had charge of the company's exhibit, stated that the convention was a success from every standpoint and that he had secured some good orders for "Inter-Comm-Phone" systems.

Popularity of Monarch Desk Type Boards.

The desk type switchboards manufactured by the Monarch Telephone Mfg. Co., of Fort Dodge, Iowa, it is stated, are being used extensively by companies operating from 100 to 300 lines. These boards are exceptionally convenient, as an ordinary chair can be used by the operator, and there is plenty of desk and pigeonhole space for keeping records.

The following towns have been equipped with Monarch desk type boards during the past month: Litchfield, Mich.; Triplett and Bronaugh, Mo.; Moorehead, Mallard, and Aurora, Iowa; Almond, Wis.; Disko, Ind.; Lakeville and Mountain Lake, Minn.

This type is made in two sizes, one which can be arranged for either 120 or 160 lines and the other for 200, 240 or 300 lines.

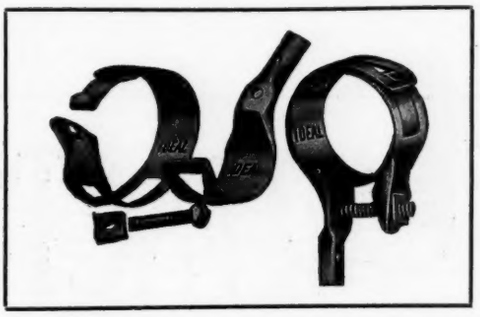
"Ideal" Ground Clamps.

Frederick Rall, general sales agent for ground clamping devices, with offices at 19 Park place, and 16 Murray street, New York, has just issued bulletin No. 1 on "Ideal" ground clamps.

The "Ideal" ground clamps are made of brass, in different gages and widths, as listed in a table in the circular. The longer strip is formed at the end with a punched lug, through which the brass clamping screw extends and a slot 1½ inch by ⅜ inch. The opposite end is narrowed to fit the slot and is bent to form a hook, as shown in the accompanying illustration. The second strip is formed at one end with a similar lug for the clamping and at the other with a triangular eyelet. When assembled the hook end of the longer strip is extended through the slot in the opposite end, and on to the pipe or conduit to be grounded. The shorter strip attached to the end of the first strip is then bent around until the punched lugs are in line, permitting the clamping screw to be placed in position. As the screw is tightened, drawing the ends together, the shorter strip draws the narrowed end of the other through the slot, thus reducing the circumference of the band until it is tightened on the pipe or conduit.

The lug for connecting the ground wire is heavily tinned and formed on the outer strip, and is of a proper size to receive a No. 4 B. & S. gage wire.

It is claimed that the "Ideal" is the only clamp which closes perfectly round over the pipe, allowing absolutely no opportunity for the slightest leakage of current, thereby insuring a perfect ground in its entire circumference. It



Parts of the Clamp and the Clamp Adjusted.

will not buckle, and can be easily slipped over a pipe, no matter in what position it may be, and will always maintain its original shape.

Mr. Rall is also prepared to furnish heavier or wider clamps in either brass or copper.

"Ideal" ground clamps are made of brass ⅝ in. and ⅞ in. wide, and in the following gages, No. 20, No. 18 and No. 16.

Book Reviews.

ELEMENTARY ELECTRICITY AND MAGNETISM, by Wm. S. Franklin and Barry MacNutt. Published by the Macmillan Co., New York. 174 pages with 152 illustrations. Price $1.25 net.

For the person who is just beginning the study of electricity, this is a most helpful book. No complicated explanations are given. The facts are stated in a direct manner that holds the interest of the reader. Illustrations differing from those ordinarily used, make clear the various points. Problems at the end of each chapter show the practical application of the textmatter. It is indeed a book which will be of greatest aid to the student and electrical worker for it is so clearly and concisely written that no one should have any difficulty in comprehending the subject matter.

ADVANCED ELECTRICITY AND MAGNETISM, by Wm. S. Franklin and Barry MacNutt. Published by the Macmillan Co., New York. 300 pages with 217 illustrations. Price $2 net

This is designed as a textbook for colleges and technical schools. The character of the treatment has been determined throughout by the desire to keep the students' minds jammed up tight against physical things. Illustrations are plentifully used and calculus is frequently resorted to in order to explain the theory involved. As is the case with the book on Elementary Electricity and Magnetism, the subject is rigidly adhered to and no unnecessary matter is incorporated to draw the student's attention away from the case in point.

DRAKE'S TELEPHONE HANDBOOK; a book for the Practical Man, by David Penn Moreton. Published by Frederick J. Drake & Co., Chicago. 285 pages with 161 illustrations. Price $1.

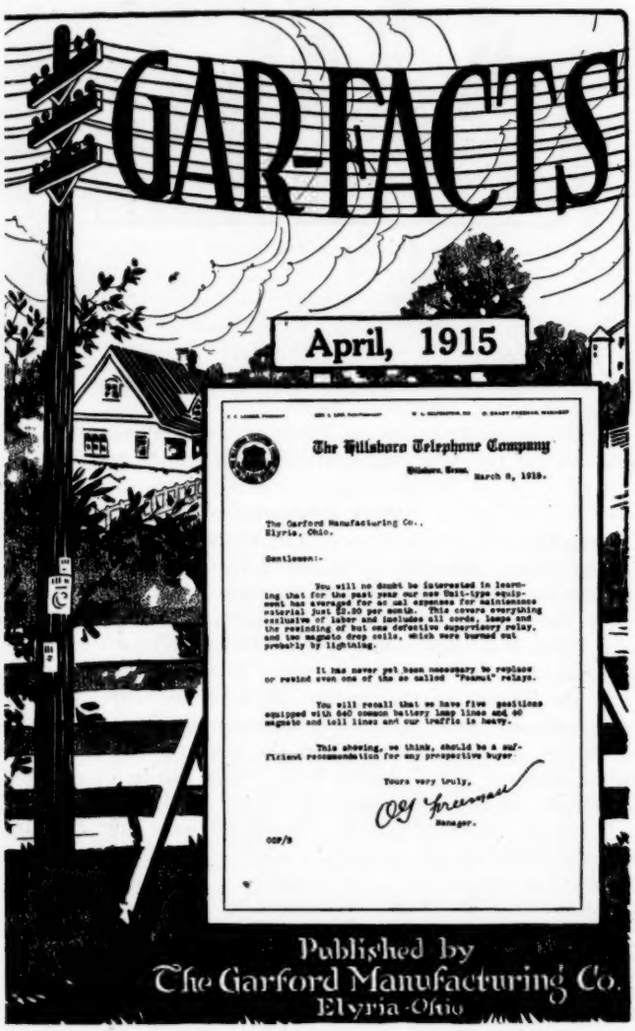
A great amount of practical matter is contained in this book. While it does not go into some of the subjects treated to any great extent, there is sufficient given so that the practical man can gain an understanding of the principles. The various circuits in common use in magneto and common battery exchanges are explained. Considerable space is devoted to the construction of telephone lines. The chapter on troubles and their

location is also of interest. The book will be of benefit to the man engaged in the smaller exchanges as it contains much which is applicable to his work, both inside and outside the exchange.

Spring Issue of Gar-Facts.

The April number of "Gar-Facts," the house organ of the Garford Mfg. Co., of Elyria, Ohio, is now being distributed to its patrons and friends.

Like issues that have gone before, this number is live, breezy and well edited. An article by Ray H. Manson, chief engineer of the Garford company, on "Garford Engineering Methods and Purposes" is well worth reading. In the accompanying illustration is reproduced the front


GAR-FACTS
April, 1915
The Hillsboro Telephone Company
March 8, 1915.
The Garford Manufacturing Co.,
Elyria, Ohio.
Gentlemen:-
You will no doubt be interested in learning that for the past year our new Unit-type equipment has averaged for us all expenses for maintenance material just $2.00 per month. This covers everything exclusive of labor and includes all cords, lamps and the rewinding of but one defective supervisory relay, and two magneto drop coils, which were burned out probably by lightning.
It has never yet been necessary to replace or rewind even one of the so called "Peanut" relays.
You will recall that we have five positions equipped with 640 common battery lamp lines and 40 magneto and toll lines and our traffic is heavy.
This showing, we think, should be a sufficient recommendation for any prospective buyer
Yours very truly,
Manager.
Published by
The Garford Manufacturing Co.
Elyria-Ohio

Cover of the Garford House Organ for April.

cover of the April issue. Telephone men who do not receive "Gar-Facts" may have their names placed upon the company's mailing list by dropping a line to the Garford Mfg. Co.

April Issue of Kellogg House Paper.

The Kellogg Switchboard & Supply Co., of Chicago, is distributing to the trade the April number of its house paper, "Telephone Facts." This issue is entitled the "Magneto Telephone Number" and has several special articles on this type of instrument, and its significance in modern telephone practice.

The cover illustration shows a kindly old veteran of the soil, getting the latest market reports. The mere presence of the telephone indicates the business farmer, as it is now indisputable that the "farm without a telephone" from a financial standpoint, loses much of its efficiency.

The May number of "Telephone Facts" will be on the magneto switchboard, and its readers may expect some very interesting and helpful articles in that issue.

New Monarch Bulletins.

The Monarch Telephone Mfg. Co., of Fort Dodge, Iowa, has just prepared a loose leaf binder for holding the different bulletins issued by the company. New bulletins have also been prepared. The company states that it will be pleased to mail a complete set of bulletins describing telephones and switchboards enclosed in one of the new binders to any one making inquiry upon the letterhead of an Independent operating company.

Paragraphs.

THE GENERAL INSULATE CO., of Brooklyn, N. Y., has appointed A. F. Larrabee, of 88 E. Congress street, Detroit, as its Michigan representative.

WALKERS BROTHERS & HAVILAND, of Chicago, have announced that on May 1 their offices will be removed from 955 Monadnock Block to 1821 Peoples Gas Building. This concern is general sales representative for the Industrial Controller Co., formerly the Independent Electric Mfg. Co., of Milwaukee, Wis., which manufactures a complete line of automatic and manually operated motor starters and rheostats. It also represents the Monarch Synchronized time system, which includes electrically operated clocks, time stamps, employes' recorders, etc.

Associated Advertising Clubs to Meet in Chicago.

It is expected that over 10,000 business men will attend the eleventh annual convention of the Associated Advertising Clubs of the World, which will be held in Chicago, June 20 to 24.

The convention proper will be held in the Auditorium Theater, while the various departmental meetings, such as retail advertisers, general advertisers, newspapers, business papers, magazines, etc., will be held in the Auditorium Hotel and Annex on the Lake Front.

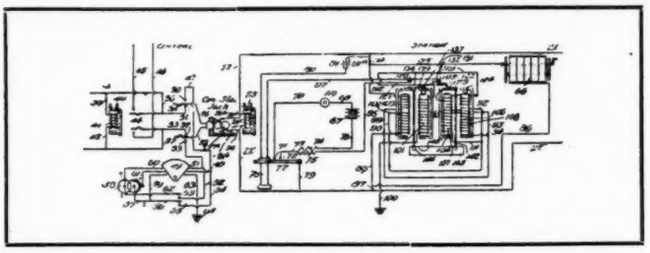
One feature of the convention which is arousing considerable interest, is the educational exhibit of the trade and technical publications. At Toronto last year this exhibit attracted a great deal of attention. One point this exhibit will emphasize will be the tendency of modern business publications to select circulations of utmost value to the advertiser. A few years ago publishers were not particular as to the buying power of a subscriber, but today they recognize that circulation of a non-buying variety is a liability. Most business publications cost many times the subscription price to produce, hence the increasing tendency to spare no effort in securing all the buying units in the field. It is this far-sighted circulation policy which has done so much to put business publications in the first rank of advertising mediums.

Illinois Association Operating Activity.

"Operating Suggestions," is the title of a booklet issued by the Illinois Independent Telephone Association. The suggestions, which are recommended by Miss Kittie M. Gang, the association's traveling chief operator, include 15 "Things to Remember," local phrases, examples to illustrate the distinct enunciation of numbers, and long distance phrases and methods. The official code for long distance operators is also given. The booklets are of a convenient size, 3½ in. by 5½ in. A heavy quality of paper is used in order to withstand the constant usage which they will undoubtedly receive.

Record of Telephone Patents Recently Issued

1,131,251. March 9, 1915. MEANS FOR CONTROLLING DIRECT CURRENT; C. D. Lanning, Boston, Mass. An electromagnetic device is provided which has its windings in series with the direct current conductor. Other means in series with the conductor are adapted to control current flow through an instrumentality operated by the electromagnetic device, responsively



No. 1,131,455.

to its varying energization. The direct current conductor is in series through the windings and the instrumentality.

1,131,389. March 9, 1915. COMBINED DROP AND JACK; W. Leaver, Chicago; assigned to Kellogg Switchboard & Supply Co. Details of construction of a combined drop and jack are given. The drop coil is arranged so that it may be readily removed from the shell without displacing the drop catch.

1,131,439. March 9, 1915. TELEPHONE RECORDER; E. R. Talley and R. P. Norton, Algona, Iowa. A shunt circuit which includes a supplemental receiver is adapted to be connected with the main telephone circuit. A graphophone is provided within a casing containing the supplemental receiver and has its recording mechanism actuated by the supplemental receiver.

1,131,455. March 9, 1915. TELEPHONE SYSTEM; H. M. Wright, Darlington, Okla. A party line lockout selective system is described. An electrically operated switch is located at each subscriber's station. Each switch is provided with polarized cores and armatures, the polarity of which at one station is different from that at another station in order to render them selective. Mechanism controllable by the electrically operated switches is provided for connecting the subscriber's set with the line and locking out other subscribers' stations. Other mechanism controllable by the same switches disconnects the subscriber's set and then connects the stations of other subscribers desiring to engage in secret conversation.

1,131,598. March 9, 1915. TELEPHONE APPARATUS; W. M. Byrnes, Vail, Iowa. A switch is described which operates to cut in or out the transmitter batteries of a magneto set by action of the hook switch or of a lever operated by hand.

1,131,624. March 9, 1915. TELEPHONE APPARATUS; J. Erickson, Chicago; assigned to First Trust & Savings Bank. The apparatus covered by this patent is a receiver switch hook. The switch springs are operated by a rotary member which is operated by the upward movement of a portion of the switch hook. One of the switch springs is adapted to restore the rotary member to normal position when the hook reaches the limit of its motion.

13,890. March 9, 1915. (Reissue No. 1,100,740.) MANUAL CALL DISTRIBUTING SYSTEM; J. H. Levis, Jr., Rochester, N. Y.; assigned to Stromberg-Carlson Telephone Mfg. Co. A selecting relay is provided for each operator's position. Devices, actuated by an operating switch provided for each selecting relay, selectively actuate the relays for successive actuations of the switch. Other devices connect an operator's telephone which is associated with the operating switch with the telephone at the position corresponding to the operating selecting relay.

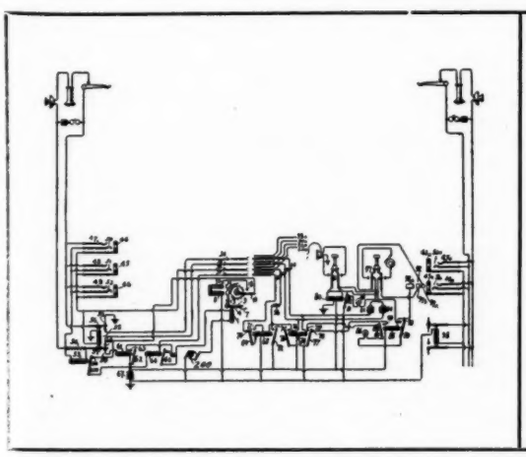
1,131,673. March 16, 1915. SIGNALING SYSTEM FOR TRAIN DISPATCHING; G. Brown, Brooklyn, N. Y.; assigned to Western Electric Co. A polarized signaling device is bridged on a telephone line to which is also connected the secondary of an induction coil. The primary winding of the coil is connected with a source of direct current through a relay which is controlled by impulses over a telegraph line. The system is used for sending time.

1,131,734. March 16, 1915. LINE SWITCH; J. N. Reynolds, Greenwich, Conn.; assigned to Western Electric Co. An automatic switch for serving large groups of lines is described. The subscriber line terminals are in groups with the trunk line terminals arranged for engagement with them. Groups of bars are arranged adjacent to each other in intersecting planes. Provision is made for rotating a bar of each group in a predetermined order, thereby effecting engagement of a line terminal with one of the other circuit terminals.

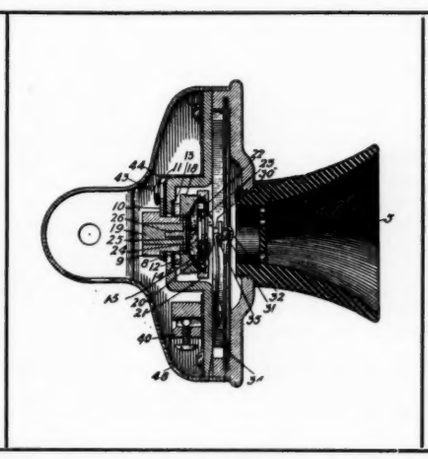
1,131,811. March 16, 1915. SELECTOR FOR MACHINE SWITCHING TELEPHONE SYSTEM; F. F. Aldendorff, Vieux Dieu, near Antwerp, Belgium; assigned to Western Electric Co. A trunk hunting selector comprising movable contacts is described. Groups of fixed contacts are arranged in a single row, each group being connected to a different group of trunk lines. Mechanism is provided for driving the movable contacts over the row of fixed contacts. The mechanism is arranged to stop the movable contacts at an idle trunk in a group. A switching relay under the control of the subscriber will cause the advance of the movable contact over the fixed contact in the group, whether they are busy or idle.

1,131,911. March 16, 1915. CALL DISTRIBUTING TELEPHONE SYSTEM; H. P. Clausen, New York; assigned to Western Electric Co. Call distributing apparatus for combination with regular common battery multiple manual systems is described. Automatic means are provided for associating any one of a number of trunk lines extending to operator's position, with any subscriber's telephone line. Provision is made to prevent the association of a subscriber's line and a trunk extending to an operator's position at which an unanswered call exists upon one of the subscribers' lines terminating at that position or one of the trunks.

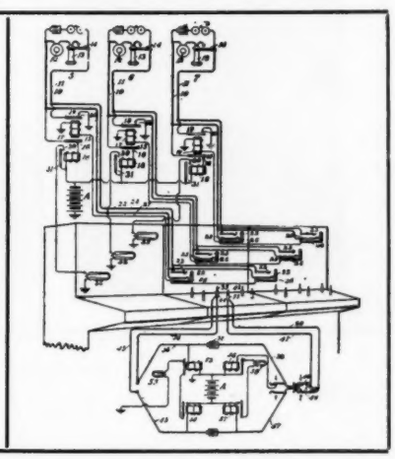
1,131,912. March 16, 1915. TELEPHONE SYSTEM; H. P. Clausen, New York; assigned to Western Electric Co. Line and cut relays are situated upon the line side of an intermediate distributing frame through which the conductors of all subscriber lines pass. A distributer switch is connected with its associated line through contact of the intermediate frame. Connection of the distributer switch may be changed from one line to another without changing the connection between the line and its multiple jacks. A motor control relay for the distribu-



Reissue No. 13,891.



No. 1,132,613.



No. 1,133,264.

ter switch is adapted to be connected with any of the telephone lines by means of jumpers extending to the contacts of the lines upon the intermediate distributing frame.

1,132,094. March 16, 1915. CONTACT MEMBER; W. F. Hosford, West Chicago, Ill.; assigned to Western Electric Co. The contact member is comprised of a strip of spring metal having a projecting contact piece of highly refractory metal, such as platinum, of smaller dimension of attaching area than the width of the strip, which is electrically welded to the latter.

1,132,107. March 16, 1915. AUTOMATIC TELEPHONE SYSTEM; F. Merk, Charlottenburg, Germany, assigned to Siemens & Halske, Berlin, Germany. The feature of this system is a repeater located between the preselector and the first selector which has line relays permanently bridged over the talking line. Devices at the repeater are provided for holding and breaking the connection.

1,132,249. March 16, 1915. SIGNALING DEVICE FOR PARTY LINES; L. Ericson, Chicago; assigned to Kellogg Switchboard & Supply Co. In this patent, details are given relative to adjustment features of a harmonic ringer.

13,891. March 16, 1915. (Reissue original patent No. 1,073,589. September 23, 1913.) TELEPHONE EXCHANGE SYSTEM; S. H. Browne, Short Hills, N. J.; assigned to American Telephone & Telegraph Co. At the central office a plurality of trunks is provided. An automatic selecting switch is connected with the subscriber's line and connects the line with an idle trunk line when a call is initiated.

1,132,613. March 23, 1915. TELEPHONE TRANSMITTER; J. C. R. Palmer, Brooklyn, N. Y.; assigned to Western Electric Co. The cell of this transmitter has a tapered wall. A stationary electrode is located at the smaller end of the cell and a second electrode, which is movable, at the opposite end. The latter electrode has exposed to the comminuted material in the chamber or cell, an area greater than that of the first electrode but less than the area of the larger end of the cell.

1,133,111. March 23, 1915. TELEPHONE EXCHANGE SYSTEM; F. W. Dunbar, Chicago; assigned to Kellogg Switchboard & Supply Co. In this system, the line and answering jack circuits are divided into groups. Automatically operated, selective mechanism is provided for distributing the calls. There are 51 claims in this patent.

1,133,112. March 23, 1915. TELEPHONE SYSTEM; F. W. Dunbar, Chicago; assigned to Kellogg Switchboard & Supply Co. The feature of this system is the provision of a service meter, the circuit of which is controlled by the switchhook of the called subscriber's line. There are 63 claims in the patent.

1,133,113. March 23, 1915. TELEPHONE SYSTEM; F. W. Dunbar, Chicago; assigned to Kellogg Switchboard & Supply Co. An automatic system for the selective switching of a call to an idle trunk circuit is described in this patent, which has 73 claims.

1,133,264. March 30, 1915. TELEPHONY; H. P. Clausen, New York; assigned to Western Electric Co. The switchboard of this patent is split up into divisions. One division contains only line signals, one for each line, and the other divisions contain only multiple jacks, one to each line in each division. The divisions are in charge of different operators. Provision is made whereby the operator in charge of the signal division may communicate to the operator in charge of any one of the jack divisions, the number of the calling line. Provision is made at the jack divisions for interconnecting the lines.

Condensed News Reports

Officers of Companies Are Urgently Requested to Forward to Us Promptly All Financial and Other Statements as Soon as Issued and Any Items of Interest as to Their Plants and Systems

Personal.

MISS DELLA GIBSON, clerk in the commercial department of the Webb City, Mo., exchange of the Home Telephone Co., of Joplin, was the Queen of the Business Men's Carnival which was held April 5 to 10 inclusive. From the list of 15 candidates, Miss Gibson was elected by a plurality of 103,000 votes.

Miss Della Gibson.

Miss Gibson has been with the Home Telephone Co. for the last eight years. During this period she was for three years recording operator in the Webb City exchange and for four years held the position of chief operator at Carterville, Mo. On February 1 of this year, she was promoted to the commercial department at the Webb City office of the Home Telephone Co., of Joplin.

Miss Gibson was presented with a $150 diamond lavalliere by Mayor Locke, of Webb City, the closing night of the Business Men's Carnival. The Webb City exchange is quite proud of the honor which has been bestowed upon one of the members of its organization.

W. L. WILSON has been appointed manager of the Rural Telephone Co., of Waupaca, Wis., to succeed P. A. Ham, who has resigned on account of ill health.

NEAL WAUGH, for the past three years manager of the Winsfield, Kans., exchange of the Missouri & Kansas Telephone Co., has resigned his position. He will be succeeded by G. M. Smith, of Kansas City.

E. L. FARWELL, of Manchester, Iowa., has been elected general manager of the Delaware County Telephone Co., of that city, succeeding the late Charles A. Peterson. F. C. Reeves was elected to the office of secretary, which position was also held by Mr. Peterson for about 15 years.

SAMUEL G. MCMEEN, of Columbus, president of the Ohio State Telephone Co., was appointed a member of the Edison Medal Committee to fill the unexpired term of H. Ward Leonard, deceased, at the April meeting of the directors of the American Institute of Electrical Engineers, held in New York City.

L. B. WRIGHT, manager of the Nevada, Mo., exchange of the Missouri & Kansas Telephone Co., has resigned his position and will take charge of his father's drug store at Fulton, Mo. The father of Mr. Wright died several months ago. J. W. Stover, of Joplin, has been appointed manager at Nevada to succeed Mr. Wright.

E. S. FISHER, manager for the Lincoln Telephone & Telegraph Co., at Havelock, Neb., for nearly 20 years, has been appointed office manager and collector for the Havelock and University Place exchanges, with headquarters at the latter place. Mr. Fisher's health has been such that he did not feel able to continue the active management of both of these exchanges and the company therefore arranged that his duties might be more congenial. F. S. Nichols will take up Mr. Fisher's duties as active manager of the two exchanges.

R. E. HILL, suburban district traffic chief of the Cumberland Telephone & Telegraph Co., at Louisville, Ky., has been made district traffic chief of the Southern Telephone Co. of Indiana, the new Bell subsidiary to which the property of the Cumberland company in southern Indiana is being transferred. Mr. Hill will supervise the traffic over the exchanges in Clark, Floyd and Washington counties and the exchanges under his jurisdiction will include those at Jeffersonville, New Albany, Charlestown, Utica, Sellersburg, Henryville, Borden, Georgetown, Salem and others.

J. C. KELSEY, vice-president of TELEPHONY, this week received an appointment as a member of the International Jury of Award of the Panama-Pacific International Exposition with special reference to Group 39 in the Department of Liberal Arts. This group comprises the exhibits relating to methods of electrical communication. Mr. Kelsey will be in San Francisco next month in connection with the work of the committee. It will probably be remembered by Mr. Kelsey's many friends that he was a member of the committee which made the awards on electrical communication exhibits at the St. Louis Exposition in 1904.

NATIONAL TELEPHONE SECURITIES CO.

This is one of the greatest propositions that has ever come before the Independent Telephone People. One which will prove whether any unity of action can be brought about among Independent Telephone interests.

Conservative investors, consider carefully this proposition. We are offering a five per cent. **cumulative, profit-sharing preferred stock.**

Preferred as to Assets and Dividends

The funds of this corporation will be **invested** in the **securities** of **other companies** on a conservative basis.

Bank stocks are considered by some as choice investments. This Company invests in securities of other companies the same as the banks do and has less risk of heavy loss on account of the risk the banks have in handling the large amount of money by so many people.

There never was an organization started with a greater field of activity nor a safer line of investment.

The shares of stock of this corporation have been placed at fifty dollars ($50.00) each for the purpose of putting them in reach of not only the stockholders of each Telephone Company, but also in reach of every manager, lineman, operator, or any other employee of any Independent Company.

Both National Associations Endorse

Independent Telephone Association of America, at Radisson Hotel, Minneapolis Convention, January 19, 20, 21, 1915:

> Resolved that this Association approves a telephone securities corporation as described by J. C. Kelsey.

National Independent Telephone Association at La Salle Hotel, Chicago, February 3, 4 and 5, 1915:

> Resolved that this Association heartily approves of the organization of a telephone securities corporation as proposed by reliable and responsible **Independent Telephone men.**

The offer of stock by the Bell Company to their employees at $1.10 signifies that they realize financing should begin at home. Their common stock does not have the opportunity of earning as great a per cent. as this preferred stock we are offering.

Be a booster for Independent securities. Work for your investment interest regardless of what state you are in, just so you are working for the Independent interests.

We offer at par unsold portion of $900,000.00 preferred stock.

Address H. H. KNIPE, Olney, Illinois
or 344 Monadnock Bldg., Chicago, Ill.

New Companies and Incorporations.

McRae, Ga.—The McRae-Helena Telephone Co. was recently incorporated and the following officers were elected for the coming year: H. C. Horton, president; J. F. Cook, vice-president; G. C. Wooten, secretary; W. D. Horton, treasurer and manager.

Springfield, Ill.—The Niantic Telephone Co. has been incorporated by B. N. Boynton, F. S. Springer and E. H. Hilliard. The capital stock of the company is $1,000.

Clear Lake, Iowa.—The South Central Mutual Telephone Co. has recently been incorporated with a capital stock of $270 with increasing privileges to the amount of $30,000. The directors are J. L. Wood, Clark Rice, John Macy, Art Baker, A. Jenson and J. S. Naylor.

McCausland, Iowa.—Articles of incorporation of the McCausland Rural Telephone Co. were filed recently with the county recorder, with a capital stock of $2,000. The officers are H. Clever, president; M. E. Fick, vice-president; L. E. Henning, secretary-treasurer.

Boones Camp, Ky.—The Boones Camp Telephone Co. has been incorporated with a capital stock of $1,000 by M. A. Wells, J. B. Wells, G. W. Pack and C. J. Wells.

Carpenter, Ky.—The Carpenter Telephone Co. has been organized with a capital stock of $400. The incorporators are W. M. Bryant, S. F. Bryant, Jim Logan, W. T. Wilson, G. D. Bennett, J. W. Reynolds and I. Frazier.

Nickell, Ky.—The Grassy & Caney Telephone Co. has been incorporated by W. R. Rudd, R. Cecil, J. H. Wilson and J. C. Stamper. The capital stock is $400.

Mable, Minn.—The Mable Telephone Co. has recently filed articles of incorporation with the secretary of state, the capital stock being $3,000. The incorporators are J. J. Johnson, president; T. E. Selness, vice-president; D. A. Haines, secretary; N. H. Nelson, treasurer.

Parkers Prairie, Minn.—The Lake Irene Telephone Co. has recently filed articles of incorporation with a capital stock of $1,500. The officers are E. Nueler, president; L. Steinke, vice-president; A. J. Abbott, secretary-treasurer.

Big Point, Miss.—The Big Point Telephone Co. was recently organized with a capital stock of $5,000. The incorporators are E. Pankhurst, E. S. Hancock and D. Cunningham.

Catawissa, Mo.—The Catawissa Telephone Co. has recently been incorporated with a capital stock of $500. The incorporators are F. Sandbrink, S. C. Denny and E. L. Sheerin.

Townsend, Mont.—The Upper Valley Telephone Co. has recently been incorporated with a capital stock of $880 by C. N. Burgess, J. E. Kanous and W. G. Boone.

Jefferson, Ohio.—The West Jefferson Home Telephone Co. has recently been incorporated with a capital stock of $10,000. The incorporators are J. C. Hamilton, C. Liggett and Frank Biggert.

Brooksville, Okla.—The Brooksville Telephone Exchange Co. has recently been incorporated with a capital stock of $2,000 by the following: N. A. Bryant, T. Corter, E. McNight, R. H. Ervin, A. R. Perry and J. A. Talkner.

Barney, N. D.—The Antelope Homestead Rural Telephone Co. has been incorporated by M. F. Fritzsche, H. E. Hanson and N. B. Langseth.

Menoken, N. D.—A telephone company has been organized by the farmers in this vicinity and is to be known as the Burleigh Farmers Telephone Co.

Williston, N. D.—The Farmers' Northwestern Telephone Co. has been incorporated with a capital stock of $21,000 by the following: J. J. Larson, P. Peterson, E. O. Sundby, F. Zemliska, P. G. Head, D. Kalil, and O. I. Wilson.

Kennebec, S. D.—The Farmers' Mutual Telephone Co. was recently incorporated with a capital stock of $3,000 by the following: J. F. Spolts, J. G. Glass and A. E. Lovell.

Vermillion, S. D.—The Vermillion Western Telephone Co. was recently incorporated with a capital stock of $1,250. The following are the directors: P. D. Lund, Wm. Gunderson, E. Myron and O. C. Larson.

Liberty, Tenn.—A telephone company has been organized here with George Edmonston as president, capital stock $1,000.

Potts Creek, Va.—The Covington & Potts Creek Telephone Co. was incorporated recently by the following: C. S. Robinson, president; J. H. Jamison, vice-president; J. W. Robinson, secretary-treasurer. The capital stock is $3,000.

Grandview, Wis.—A rural telephone company has been organized here with the following officers: A. N. Anderson, president; J. Windall, vice-president; Charles Moland, secretary-treasurer.

Construction.

Vevag, Ind.—K. L. Hastings, manager of the Ohio River Telephone Co., is arranging for a new line to Moorefield.

Kalamazoo, Mich.—The Michigan Telephone Co. will make improvements to the extent of $50,000 in this city in the near future. Underground cable is to be installed in the principal streets.

Houston, Tex.—The Southwestern Telegraph & Telephone Co. is preparing to rebuild its long distance pole line between Houston and the Texas-Louisiana line, a distance of 114 miles.

Jellico, Tenn.—The Cumberland Telphone & Telegraph Co. is preparing to expend approximately $8,000 in repairing and extending the service in this vicinity.

Financial.

Buffalo, Ind.—The Citizens Telephone Co. declared a dividend of 15 per cent. at a recent directors meeting.

Elections.

Brighton, Ill.—At the annual stockholders' meeting of the Brighton Mutual Telephone Co. the following officers were elected: President, S. G. Brown; vice-president, H. Stamme; secretary, G. Hunt; treasurer, J. J. Kelsey.

Wataga, Ill.—At its annual meeting the Wataga Farmers' Mutual Telephone Co. elected the following officers for the coming year: President, H. J. Kunkle; secretary, O. S. Olson; treasurer, L. N. Edwards; directors, J. E. Williamson, M. F. Shea and H. S. Robson.

Economy, Ind.—The stockholders of the Modoc Telephone Co. held their annual meeting recently at which the officers were elected: President, W. E. Oler; secretary-treasurer, C. A. Morrison; directors, F. Thornburgh and H. Hormal.

Thorntown, Ind.—The Thorntown Co-Operative Telephone Co. recently elected the following directors for a term of three years: J. E. Royer, L. W. Beesley and J. Goldsberry.

Barnes City, Iowa.—The Barnes City Mutual Telephone Co. held its annual meeting recently and elected the following officers for the coming year: E. McClure, president; Hommer Musser, secretary; F. A. Watts, treasurer.

Ireton, Iowa.—At the annual meeting of the Ireton Rural Telephone Co. the following officers were elected: President, F. J. McNally; vice-president, D. G. Johnston; secretary, R. H. Younie.

Kamrar, Iowa.—The Farmers' Rural Telephone Co. elected the following officers for the coming year at its annual meeting: E. D. Waterman, president; F. A. Gerber, secretary; H. E. Johnson, treasurer; N. Nelson and F. L. Daniels, directors.

Auburn, Kans.—The South Auburn Telephone Co. held its annual meeting recently and elected the following officers for the ensuing year: M. Cunningham, president; R. McCauley, secretary-treasurer.

Owosso, Mich.—The Union Telephone Co. has elected the following officers for the coming year: President, C. T. Babcock; vice-president, A. M. Bently; secretary, L. L. Conn; treasurer, E. O. Dewey.

Wells, Minn.—The Up-To-Date Telephone Co. held its regular annual meeting recently at which the officers were elected as follows for the ensuing year: President, Geo. Quade; vice-president, F. C. Krusp; secretary, F. E. Passer; treasurer, H. Biesterfeldt.

Junction, Ohio.—The annual meeting of the Rush Creek Telephone Co. was held recently and officers were elected for the coming year. The new officers are W. O. Cary, president, Columbus; W. B. Cosgrave, vice-president, Zanesville; J. B. Rhodes, secretary-treasurer, Zanesville; manager, John Murphy.

Nineveh, Pa.—The annual meeting of the Farmers' Telephone Co. was recently held and new officers elected as follows: President, I. J. Cutter; vice-president, S. McCullough; secretary, J. J. McKee; treasurer, M. C. Huffman.

Cresco, Pa.—At a meeting of the Cresco & Greentown Telephone Co. officers were elected as follows: President, G. W. Crane; vice-president, F. W. Brown; secretary-treasurer, M. D. Megargle.

Franchise.

Foraker, Okla.—A franchise to construct and operate a telephone system here has been granted to H. H. Romine.

Waco, Tex.—The Brazos Valley Telegraph & Telephone Co. has amended its charter so as to change its name to the Texas Long Distance Telephone Co.